



Final

**Nevada Test and Training Range
Depleted Uranium
Target Disposal
Environmental Assessment**



Prepared for
**Headquarters Air Combat Command
Langley Air Force Base, VA and
Nellis Air Force Base, NV**

**In Cooperation
with the
National Nuclear
Security Administration**



March 2005

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14. ABSTRACT

The purpose of the proposed action is to allow the Air Force to employ a suite of optional tools for disposal of DU-contaminated targets and TDMR. The proposal would permit the Air Force to dispose of targets and TDMR contaminated by DU and would further define disposal activities as outlined in the NTTR DU Management Plan and in accordance with Air Force Instruction 13-212V1 Range Planning and Operations. Target 63-10 and the DU library have been in existence since the 1970s when they were established for DU munitions training and testing. Target 63-10 comprises the only authorized site in the United States for Air Force DU air-to-ground testing and training. When the targets within Target 63-10 no longer retain fidelity or allow for recognition of DU penetrator entries, the targets and/or TDMR are removed to the DU library. Under the proposed action, the Air Force would use a suite of methods to declassify, decontaminate and reuse targets elsewhere on NTTR, declassify and transport targets and TDMR for disposal to an approved, licensed lowlevel waste (LLW) disposal facility, or transport classified targets to a classified LLW disposal facility (i.e. Nevada Test Site). Methods employed and final disposition of the targets and TDMR would depend on three factors: target condition, target classification, and level of contamination. Implementation of disposal would begin in 2005 and continue into the foreseeable future with the number of targets disposed of in a given year dependant on training tempo and available funding. Because the targets and TDMR are contaminated by DU, the Air Force would employ strict handling, transport, and disposal measures. The Air Force has instructions for processing low-level radioactive materials for packaging and transport that consider the safety and protection of the military and general public and are in compliance with Department of Transportation, Nuclear Regulatory Commission, Department of Energy, and Environmental Protection Agency regulations. In addition to the proposed action, the Air Force analyzed two alternatives: 1) on-site above ground monitoring and 2) no action. Under the on-site above ground monitoring alternative, air, water, and soil monitoring would be performed at Target 63-10 and DU library; neither disposal nor reuse would occur. For the no-action alternative the Air Force would not dispose of DU-contaminated targets and TDMR from the DU library. Targets could be added to or taken from the DU library for use in Target 63-10, but no targets would be moved outside the boundaries of the DU-licensed area.

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ACRONYMS AND ABBREVIATIONS

| | | | |
|------------------|---|------------------|--|
| ACC | Air Combat Command | MCL | Maximum Contaminant Levels |
| AEA | Atomic Energy Act | MOUT | Military Operations in Urban Terrain |
| AEI | Air Emissions Inventory | mrem | Millirem |
| AFAF | Air Force Auxiliary Field | NAAQS | National Ambient Air Quality Standards |
| AFB | Air Force Base | NAC | Nevada Administrative Code |
| AFI | Air Force Instruction | NAP | Native American Program |
| AFIERA/SDRH | Air Force Institute of Environmental Safety and Health Risk Analysis, Health Physics Branch | NAFB | Nellis Air Force Base |
| AFIOH | Air Force Institute for Operational Health | NBMG | Nevada Bureau of Mines and Geology |
| AFRMWO | Air Force Radioactive and Mixed Waste Office | NDEP | Nevada Division of Environmental Protection |
| DPM | Disintegrations per Minute | NEL | Nevada Environmental Laboratories |
| BAPC | Bureau of Air Pollution Control | NEPA | National Environmental Policy Act |
| CAA | Clean Air Act | NNSA | National Nuclear Security Administration |
| CAAA | Clean Air Act Amendments | NO ₂ | Nitrogen Dioxide |
| CEQ | Council of Environmental Quality | NO _x | Nitrogen Oxides |
| CFR | Code of Federal Regulations | NRC | Nuclear Regulatory Commission |
| CO | Carbon Monoxide | NTTR | Nevada Test and Training Range |
| CWA | Clean Water Act | NTS | Nevada Test Site |
| DAC | Derived Air Concentration | O ₃ | Ozone |
| DoD | Department of Defense | OSHA | Occupational Safety and Health Act |
| DOE | Department of Energy | Pb | Lead |
| DOT | Department of Transportation | PL | Public Law |
| DU | Depleted Uranium | PM ₁₀ | Particulate Matter less than 10 microns |
| DNWR | Desert National Wildlife Range | PSD | Prevention of Significant Deterioration |
| DRC | Document Review Committee | RCRA | Resource Conservation and Recovery Act |
| EA | Environmental Assessment | rem | Reontgen Equivalent Man |
| EIAP | Environmental Impact Analysis Process | RESRAD | Residual Radiation |
| EPA | Environmental Protection Agency | RIC | Radioisotope Committee |
| ESA | Endangered Species Act | SHPO | State Historic Preservation Office |
| FONSI | Finding of No Significant Impact | SIP | State Implementation Plan |
| H ₂ S | Hydrogen Sulfide | SO ₂ | Sulfur Dioxide |
| HASP | Health and Safety Plan | SO _x | Sulfur Oxides |
| HEPA | High Efficiency Particulate Air | TCLP | Toxic Characteristic Leaching Procedure |
| HQ | Headquarters | TDMR | Target Debris Munitions Residue |
| HTTC | High-Technology Test and Training Complex | UNEP | United Nations Environment Program |
| IICEP | Interagency and Intergovernmental Coordination for Environmental Planning | USACE | United States Army Corps of Engineers |
| JAWS | Joint Munitions Effectiveness Manual | USAF | United States Air Force |
| LLW | Air-to-Surface Weaponneering System | USC | United States Code |
| | Low-Level Waste | USDA | United States Department of Agriculture |
| | | USAEC | United States Atomic Energy Commission |
| | | USEPA | United States Environmental Protection Agency |
| | | USFWS | United States Fish and Wildlife Service |
| | | VOC | Volatile Organic Compound |
| | | WAC | Waste Acceptance Criteria |

FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF THE PROPOSED ACTION

Nevada Test and Training Range Depleted Uranium Target Disposal.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The U.S. Air Force (Air Force), Headquarters Air Combat Command (ACC) proposes to implement a flexible suite of disposal options for depleted uranium (DU)-contaminated targets (i.e., tanks and vehicles) and target debris munitions residue (TDMR) from Target 63-10 and the DU library at the Nevada Test and Training Range (NTTR). The proposal would permit the Air Force to dispose of targets and TDMR contaminated by 30-mm DU rounds fired by A-10 aircraft for test and training purposes. Implementation of this proposal would further define disposal activities as outlined in the NTTR DU Management Plan (Air Force 2000) and in accordance with AFI 13-212V1 *Range Planning and Operations* and AFI 40-201 *Managing Radioactive Materials in the USAF (U.S. Air Force)*.

Under the proposed action, the Air Force would use a suite of methods to declassify, decontaminate, and reuse targets elsewhere on NTTR, declassify and transport targets and TDMR for disposal to an approved, licensed low-level waste (LLW) disposal facility, or transport classified targets to the Nevada Test Site. Transportation requirements are well defined by the U.S. Department of Transportation (DOT) and state regulations. The National Hazardous Materials Route Registry provides information regarding state-specific limitations and/or route prescriptions for transport of hazardous materials, including radioactive materials and waste. Transportation of the targets and TDMR would adhere to both DOT and Nevada requirements.

Methods employed and final disposition of the targets and TDMR would depend on three factors: target condition, target classification, and level of contamination. Implementation of disposal would begin in 2005 and continue into the foreseeable future with the number of targets disposed of in a given year depending on training tempo and available funding.

In addition to the proposed action, the Air Force analyzed two alternatives. The first, on-site above ground monitoring, would retain all targets and target debris munitions residue on-site within the DU library. This alternative would involve long-term above-ground storage accompanied by air, water, and soil monitoring. The second alternative, no-action, would not monitor or dispose of targets and TDMR. Under the no-action alternative, the status quo at the DU library and Target 63-10 would be maintained.

3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The Environmental Assessment provides an analysis of the potential environmental impacts resulting from implementing the proposed action or action alternatives. The Air Force assessed numerous resources that, in accordance with Council on Environmental Quality (CEQ) regulations, warranted no further examination. Those resources reviewed but not analyzed in detail in this assessment include:

socioeconomics and environmental justice; airspace management; noise; and land management and use, recreation, and visual resources.

Six resource areas were evaluated in detail to identify potential environmental consequences: air quality; soils and water resources; hazardous and radioactive materials and waste; health and safety; biological resources; and cultural resources. As summarized below, implementation of the proposed action or the alternatives would not result in any significant impacts.

Air Quality. Under the proposed action, additional emissions of the following criteria pollutants would be created each year during preparation, packaging, and transport of tanks and TDMR: 0.36 tons CO, 0.14 PM₁₀, 0.05 VOCs, 0.25 NO_x, and 0.02 of SO_x. This represents less than 0.000001 percent of total Clark County emissions, well below *de minimus* levels for CO and PM₁₀ nonattainment areas. NTTR activities currently contribute less than 1 percent of total Clark County criteria pollutant emissions of CO, VOCs, PM₁₀, and SO₂ and approximately 11 percent of NO. Emissions would remain unchanged under the on-site above ground monitoring alternative and under the no-action alternative. Periodic air monitoring would occur under the on-site above ground monitoring alternative.

Soils and Water Resources. Implementation of the proposed action would result in no more than 1 acre of soil being disturbed each year through preparation, loading, and transport. The process of preparation and packaging would not expand dispersal of DU contamination in the upper few inches of soil beyond the current extent of 350 feet from Target 63-10 and in the immediate vicinity of the DU Library. No evidence exists to show that DU contamination would enter surface or groundwater. Downward settling in the soil or traces of DU in the small washes at the DU library, Target 63-10, and surrounding area to 350 feet would not occur. Nellis AFB would conduct periodic air, soil, and water monitoring under the on-site above ground monitoring alternative. Under both the on-site above ground monitoring and no-action alternatives, no additional soils would be disturbed since tanks and TDMR would not be disposed.

Hazardous and Radioactive Materials and Waste. No new waste streams would be created through implementation of the proposed action. Disposal of the DU-contaminated materials would take place at an approved LLW facility and transport of these materials would follow DOT designated routes to the LLW disposal facility. Under both the on-site above ground monitoring and no-action alternatives, no DU-contaminated tanks or TDMR would be disposed of and would remain at the DU library. Existing hazardous materials storage and handling procedures remain unchanged under the both on-site above ground storage and no-action alternatives.

Health and Safety. Existing handling procedures to ensure human health and safety would continue unchanged under the proposed action. The Air Force would follow regulated disposal procedures (e.g., breathing equipment and protective clothing) to ensure DU-contaminated tanks and TDMR are packaged and transported correctly to minimize any potential effects to the environment. Periodic collection and analysis of air and soil samples for radiological and heavy metal contamination to assess potential contamination migration over time via resuspension, wind dispersal, surface movement, and vertical migration in soils would be undertaken under the on-site above ground monitoring alternative. No changes to existing penetrator handling and disposal procedures would occur. The no-action alternative would implement existing handling procedures to ensure human health and safety and would continue unchanged.

Biological Resources. Under the proposed action, vehicle traffic involved in loading and transporting tanks and TDMR would negligibly effect localized vegetation. The vegetation found within the active target area and DU Library has been routinely disturbed; no native habitats would be affected. Wildlife may be disturbed by equipment noise during disposal preparation; however, this noise would be infrequent and localized. The threatened desert tortoise has been recorded in the general area encompassing the DU-licensed area. While these tortoises are rare, the habitat conditions at the DU library and target array are poor. Therefore DU-contaminated material disposal is unlikely to affect desert tortoise populations or their recovery. However, a desert tortoise monitor would be present during removal operations. Since no preparation, loading, and transport would occur with implementation of on-site above ground monitoring and no-action alternatives, it is unlikely that existing effects to vegetation and wildlife would change. The periodic monitoring of air, soil, and water would result in only minor effects from light-duty vehicular traffic to the DU library and Target 63-10—no significant increase or difference in operations found under existing conditions. Existing conditions of light-duty vehicular traffic for NTTR maintenance and range operations would continue under the no-action alternative. No significant impact to vegetation, wildlife, and threatened and endangered species would be expected through implementation of any of the action alternatives. The USFWS concurs with the Air Force that activities under the proposed action fall under current activities addressed in the USFWS 2003 Biological Opinion and its Amendment.

Cultural Resources. No National Register-eligible archaeological, architectural, or traditional resources have been identified at the DU library and Target 63-10. Disposal of DU-contaminated materials under the proposed action should not affect cultural resources. Periodic monitoring of air, soil, and water under the on-site above ground monitoring alternative would not affect cultural resources. Under the no-action alternative, conditions at the DU library and Target 63-10 would remain unchanged. The Nevada SHPO concurs with the Air Force finding of no effect to this resource. The Native American Program Document Review Committee, composed of five members selected by the Consolidated Group of Tribes and Organizations to represent 17 tribes with ancestral ties to NTTR, reviewed the EA. The Document Review Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the report. The comments of the Document Review Committee have been incorporated into the final EA.

4.0 CONCLUSION

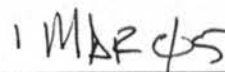
On the basis of the finding of the Environmental Assessment, no significant impact to human health or the natural environment would be expected from implementation of the proposed action or on-site above ground monitoring alternative. Therefore, issuance of a Finding of No Significant Impact is warranted, and preparation of an Environmental Impact Statement, pursuant to the National Environmental Policy Act of 1969 (Public Law 91-190) is not required.



ROBERT C. BARRETT

Chairperson

ACC Environmental Leadership Board



Date

Final

NEVADA TEST AND TRAINING
RANGE DEPLETED URANIUM
TARGET DISPOSAL
Environmental Assessment

**United States Air Force
Air Combat Command**

In Cooperation with the
National Nuclear Security Administration

March 2005

COVER SHEET
NEVADA TEST AND TRAINING RANGE
DEPLETED URANIUM TARGET DISPOSAL
ENVIRONMENTAL ASSESSMENT

Responsible Agency: United States Air Force, Air Combat Command

Cooperating Agency: National Nuclear Security Administration

Proposed Action: To implement a flexible suite of disposal options for depleted uranium (DU)-contaminated targets and target debris munitions residue (TDMR) from Target 63-10 and adjacent DU library located at the Nevada Test and Training Range (NTTR). The proposal would permit the Air Force to dispose of targets (mostly old tanks) and TDMR contaminated by 30-mm DU rounds fired by A-10 aircraft for test and training purposes.

Written comments and inquiries regarding this document should be directed to:

HQ ACC/CEVP
129 Andrews St., Ste 102
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In addition, the document can be viewed on and downloaded from the World Wide Web at www.cevp.com.

Designation: Final Environmental Assessment

Abstract: The purpose of the proposed action is to allow the Air Force to employ a suite of optional tools for disposal of DU-contaminated targets and TDMR. The proposal would permit the Air Force to dispose of targets and TDMR contaminated by DU and would further define disposal activities as outlined in the NTTR DU Management Plan and in accordance with Air Force Instruction 13-212V1 *Range Planning and Operations*. Target 63-10 and the DU library have been in existence since the 1970s when they were established for DU munitions training and testing. Target 63-10 comprises the only authorized site in the United States for Air Force DU air-to-ground testing and training. When the targets within Target 63-10 no longer retain fidelity or allow for recognition of DU penetrator entries, the targets and/or TDMR are removed to the DU library.

Under the proposed action, the Air Force would use a suite of methods to declassify, decontaminate and reuse targets elsewhere on NTTR, declassify and transport targets and TDMR for disposal to an approved, licensed low-level waste (LLW) disposal facility, or transport classified targets to a classified LLW disposal facility (i.e., Nevada Test Site). Methods employed and final disposition of the targets and TDMR would depend on three factors: target condition, target classification, and level of contamination. Implementation of disposal would begin in 2005 and continue into the foreseeable future with the number of targets disposed of in a given year dependant on training tempo and available funding. Because the targets and TDMR are contaminated by DU, the Air Force would employ strict handling, transport, and disposal measures. The Air Force has instructions for processing low-level radioactive materials for packaging and transport that consider the safety and protection of the military and general public and are in compliance with Department of Transportation, Nuclear Regulatory Commission, Department of Energy, and Environmental Protection Agency regulations.

In addition to the proposed action, the Air Force analyzed two alternatives: 1) on-site above ground monitoring and 2) no action. Under the on-site above ground monitoring alternative, air, water, and soil monitoring would be performed at Target 63-10 and DU library; neither disposal nor reuse would occur. For the no-action alternative, the Air Force would not dispose of DU-contaminated targets and TDMR from the DU library. Targets could be added to or taken from the DU library for use in Target 63-10, but no targets would be moved outside the boundaries of the DU-licensed area.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This Environmental Assessment (EA) analyzes the potential environmental consequences resulting from the United States Air Force (Air Force) proposal to dispose of targets (i.e., tank and vehicle targets) and target debris munitions residue (TDMR – i.e., inert munitions, metal, wood, and rubber) contaminated by depleted uranium (DU) munition rounds. The targets and TDMR are located at the Nevada Test and Training Range (NTTR) DU licensed area, Target 63-10, and the DU library. The proposal would permit the Air Force to dispose of targets and TDMR contaminated by 30-mm DU rounds fired by A-10 aircraft for test and training purposes. Implementation of this proposal would further define disposal activities as outlined in the NTTR DU Management Plan (Air Force 2000) and in accordance with Air Force Instruction (AFI) 13-212V1 *Range Planning and Operations* and AFI 40-201 *Managing Radioactive Materials in the USAF (U.S. Air Force)*. Under the proposed action, the Air Force would use a suite of methods to decontaminate and reuse targets elsewhere on NTTR, declassify and transport targets and TDMR for disposal to an approved, licensed low-level waste (LLW) disposal facility, or transport classified targets to a classified LLW disposal facility (i.e., Nevada Test Site). Methods employed and final disposition of the targets and TDMR would depend on three factors: target condition, target classification, and level of contamination. Implementation of disposal would begin in 2005 and continue into the foreseeable future with the number of targets disposed of in a given year depending on training tempo and available funding.

This EA has been prepared by the Air Force, Headquarters Air Combat Command (HQ ACC) in cooperation with the National Nuclear Security Administration (NNSA), in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and AFI 32-7061 the Environmental Impact Analysis Process (EIAP), as promulgated in Title 32 of the Code of Federal Regulations (CFR) Part 989.

PURPOSE AND NEED FOR THE NTTR DEPLETED URANIUM TARGET DISPOSAL

Target 63-10 and the DU library have been in existence since the 1970s when Target 63-10 was established for DU munitions training and testing. Target 63-10 was used in the 1970s, 1980s, and into the 1990s until a request from the U.S. Fish and Wildlife Service (USFWS) resulted in suspension of operations at Target 63-10; use of this target resumed in 2002. Target 63-10 comprises the only authorized site in the United States for Department of Defense (DoD) DU air-to-ground testing and training. When the tank targets no longer retain fidelity or allow for recognition of DU penetrator entries, the targets and/or TDMR are removed to the DU library.

Information demonstrates (AFIOH 2003a) that the majority of the approximately 180 DU-contaminated targets and TDMR require disposal from the library. Implementation of a suite of tools would allow the Air Force to begin disposing of targets and TDMR from the DU library, consistent with the *NTTR DU*

Management Plan and in accordance with AFI 13-212V1 and AFI 40-201. Therefore, the purpose of the proposed action is to allow the Air Force to employ a suite of optional tools for disposal of DU-contaminated targets and TDMR. Such an optional suite of tools would meet the need to dispose of targets and TDMR from the DU library while providing sufficient tank targets for continued use of Target 63-10 for testing and training. The tools need to include but not be limited to target decontamination, reuse, transport, and in- and out-of-state disposal locations. The tools also must support appropriate handling and disposal of classified materials. Lastly, the tools must provide flexibility to the Air Force that recognizes year-to-year variations in funding available for disposal.

The Air Force may receive, possess, transfer, and store DU munitions and materials under the authority granted in AFI 40-201. Target 63-10 and the DU library operate under a Master Materials License 42-23539-02/02AFP issued by the Nuclear Regulatory Commission (NRC) and a Material Permit NV-30048-02/02AFP (2004) regulated by the Air Force Radioisotope Committee (RIC). The Nellis AFB 98 Range Wing manages and maintains Target 63-10 and the DU library. While Nellis AFB Bioenvironmental staff assists with evaluating the condition of the targets and DU licensed area, the Air Force Institute for Operational Health (AFIOH), under the jurisdiction of the RIC, is responsible for monitoring radioactivity.

PROPOSED ACTION AND ALTERNATIVES

In accordance with AFI 13-212V1 and AFI 40-201, the Air Force determined that targets and TDMR in the DU library required disposal. To meet this goal, the proposed action would implement optional methods for disposal of the DU-contaminated targets and TDMR, permitting the Air Force to adjust annual disposal activities based on operations and funding.

Under the proposed action, the Air Force would employ strict handling, transport, and disposal measures for the contaminated targets and TDMR in the DU library. Such measures are defined by regulations and guidelines from the Air Force, Department of Energy (DOE), NRC, Department of Transportation (DOT), DoD, and Environmental Protection Agency (EPA). The Air Force has instructions for processing radioactive materials for packaging and transport that consider the safety and protection of the military and general public. AFI 40-201 identifies installation- and range-level responsibility for implementing safety and precautionary procedures around radiation sources/emitters (i.e., DU-contaminated targets and debris). It also defines the requirements for packaging and transport of radioactive material, radioactive waste management, and radioactive materials disposal. Air Force guidelines for packaging and transport of radioactive waste materials from the site of use or on public highways as promulgated in the 10 CFR 71, *Packaging and Transportation of Radioactive Material* and 49 CFR, *Transportation* would be implemented. Any transport of targets or TDMR would adhere to DOT and State of Nevada requirements, including the use of routes identified in the National Hazardous Materials Registry.

Based on existing evaluations, more than half (55 percent) of the targets require treatment as classified materials and most (90 percent) do not qualify for decontamination or free release. Although not classified, all TDMR would require disposal.

Implementation of different combinations of tools over the duration of the disposal process would stem from several factors. Training needs, tempo, and available funding would dictate annual disposal efforts. The different tools would include: declassification, decontamination, reuse on NTTR, reuse at Target 63-10, packaging, transport for disposal, and disposal. Each tool would involve optional methods.

The Air Force also assessed two alternatives to the proposed action: on-site above ground monitoring and the no-action alternative. On-site above ground monitoring would not dispose of targets and TDMR from the DU library; however, the Air Force would perform air, water, and soil monitoring at the DU library and Target 63-10. Under the no-action alternative, no changes to how the DU-contaminated targets and TDMR are currently managed would occur. The status quo would continue.

MITIGATION MEASURES

In accordance with 32 CFR 989.22, the Air Force must indicate if any mitigation measures would be needed to implement the proposed action or any alternative selected as the preferred alternative under this environmental assessment. For the purposes of this EA, no mitigation measures are proposed to arrive at a finding of no significant impact if the proposed action or alternatives were selected for implementation.

SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

According to the analysis in this EA, implementation of the proposed action or alternatives would not result in significant impacts in any resource category. Implementing the proposed action would not significantly affect existing conditions at NTTR, the DU library, or Target 63-10. Table ES-1 summarizes and compares the results of the analysis by resource category for each alternative.

| Table ES-1 Comparison of Alternatives by Resource and Potential Environmental Consequences | | |
|---|--|--|
| <i>Proposed Action</i> | <i>On-Site Above Ground Monitoring Alternative</i> | <i>No-Action Alternative</i> |
| Air Quality | | |
| Additional emissions of the following criteria pollutants would be created each year during preparation, packaging, and transport of tanks and TDMR: 0.36 tons CO, 0.14 PM ₁₀ , 0.05 VOCs, 0.25 NO _x , and 0.02 of SO _x . This represents less than 0.000001 percent of total Clark County emissions, well below <i>de minimus</i> levels for CO and PM ₁₀ nonattainment areas. | Emissions remain unchanged relative to baseline/no-action alternative levels. NTTR activities contribute less than 1 percent of total Clark County criteria pollutant emissions of CO, VOCs, PM ₁₀ , and SO ₂ and approximately 11 percent of NO _x . Periodic air monitoring would occur under this alternative. | Emissions remain unchanged relative to baseline/no-action alternative levels. NTTR activities contribute less than 1 percent of total Clark County criteria pollutant emissions of CO, VOCs, PM ₁₀ , and SO ₂ and approximately 11 percent of NO _x . |
| Soils and Water Resources | | |
| Preparation, packaging, transport, and disposal would not expand dispersal of DU contamination in the upper few inches of soil beyond current extent of 350 feet from Target 63-10 and in the immediate vicinity of the DU library; no evidence that DU contamination would enter surface or groundwater. No more than 1 acre of soil would be disturbed each year, to a depth of no more than a few inches, through preparation, loading, and transport. | Existing conditions of no downward settling in the soil or traces of DU in the small washes at the DU library, Target 63-10, and surrounding area to 350 feet would remain unchanged. No migration of DU to surface or ground water sources would continue; however, Nellis AFB would conduct periodic soil and water monitoring under this alternative. No additional soils would be disturbed since targets and TDMR would not be disposed. | Existing conditions of no downward settling in the soil or traces of DU in the small washes at the DU library, Target 63-10, and surrounding area to 350 feet would remain unchanged. No migration of DU to surface or ground water sources would occur. |
| Hazardous and Radioactive Materials and Waste | | |
| No new waste streams would be created. Disposal of the DU-contaminated materials would take place at an approved LLW facility and transport of these materials would follow DOT designated routes and Nevada requirements to the LLW disposal facility. | Periodic collection and analysis of air and soil samples for radiological and heavy metal contamination to assess potential contamination migration over time via resuspension, wind dispersal, surface movement, and vertical migration in soils would be undertaken. No changes to existing penetrator storage and disposal procedures would occur. No DU-contaminated targets or TDMR would be disposed. DU-contaminated targets and TDMR would remain at the DU library. | Existing hazardous materials storage and handling procedures remain unchanged. DU penetrators are stored in munitions storage areas on Nellis AFB, loaded onto A-10 aircraft along the flightline, and fired at Target 63-10. Penetrators found on the ground surface at Target 63-10 are annually disposed and processed according to existing procedures and regulations for such materials. |

| Table ES-1 Comparison of Alternatives by Resource and Potential Environmental Consequences (con't) | | |
|---|--|---|
| <i>Proposed Action</i> | <i>On-Site Above Ground Monitoring Alternative</i> | <i>No-Action Alternative</i> |
| Health and Safety | | |
| Existing handling procedures to ensure human health and safety would continue unchanged. The Air Force would follow regulated disposal procedures (e.g., breathing equipment and protective clothing) to ensure DU-contaminated targets and TDMR are packaged and transported correctly to minimize any potential effects to the environment. | Periodic collection and analysis of air and soil samples for radiological and heavy metal contamination to assess potential contamination migration over time via resuspension, wind dispersal, surface movement, and vertical migration in soils would be undertaken. No changes to existing penetrator handling and disposal procedures would occur. | Existing handling procedures to ensure human health and safety would continue unchanged. The Air Force would follow regulated handling and disposal procedures (e.g., breathing equipment and protective clothing) to ensure spent DU penetrators found on the surface are packaged and processed for disposal. |
| Biological Resources | | |
| Vehicles used to load and transport targets and TDMR would negligibly effect localized vegetation; however, this vegetation is found within an active target area and has been routinely disturbed and no native habitats would be affected. Wildlife may be disturbed by equipment noise during disposal preparation; however, this noise would be infrequent and localized. The threatened desert tortoise have been recorded in the general area encompassing the DU-licensed area. While these tortoises are rare, the habitat conditions at the DU library and target array are poor. Therefore, DU-contaminated material disposal is unlikely to affect desert tortoise populations or their recovery. However, a monitor would be present during removal operations. | Since no preparation, loading, and transport would occur, it is unlikely that existing effects to vegetation and wildlife would change. The periodic monitoring of air, soil, and water would result in only minor effects from light-duty vehicular traffic to the DU library and Target 63-10—no significant increase or difference in operations found under existing conditions. | Existing conditions of light-duty vehicular traffic for NTTR maintenance and range operations would continue. No significant impact to vegetation, wildlife, and threatened and endangered species would result. |

| Table ES-1 Comparison of Alternatives by Resource and Potential Environmental Consequences (con't) | | |
|--|--|--|
| <i>Proposed Action</i> | <i>On-Site Above Ground Monitoring Alternative</i> | <i>No-Action Alternative</i> |
| Cultural Resources | | |
| No National Register-eligible archaeological, architectural, or traditional resources have been identified at the DU library and Target 63-10; the area is highly disturbed. Disposal of DU-contaminated materials should not affect cultural resources. SHPO concurs with finding of no effect. The Native American Program Document Review Committee, composed of five members who were selected by the Consolidated Group of Tribes and Organizations to represent 17 tribes with ancestral ties to NTTR, reviewed the EA. Their comments were incorporated into the final EA. The Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the report. | No National Register-eligible archaeological, architectural, or traditional resources have been identified at the DU library and Target 63-10; the area is highly disturbed. Periodic monitoring of air, soil, and water should not affect cultural resources. SHPO concurs with finding of no effect. The Native American Program Document Review Committee, composed of five members who were selected by the Consolidated Group of Tribes and Organizations to represent 17 tribes with ancestral ties to NTTR, reviewed the EA. Their comments were incorporated into the final EA. The Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the report. | The DU library and Target 63-10 are found in a highly disturbed area that has been found not to support archaeological, architectural, or traditional cultural resources. These conditions would remain unchanged. The Native American Program Document Review Committee, composed of five members who were selected by the Consolidated Group of Tribes and Organizations to represent 17 tribes with ancestral ties to NTTR, reviewed the EA. Their comments were incorporated into the final EA. The Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the report. |

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CHAPTER 1

PURPOSE AND NEED FOR THE PROPOSED ACTION

CHAPTER 1

PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The United States Air Force (Air Force) proposes to dispose of targets (i.e., tank and vehicle targets) and target debris munitions residue (TDMR – i.e., inert munitions, metal, wood, and rubber) contaminated by depleted uranium (DU) munition rounds at the Nevada Test and Training Range (NTTR) DU licensed area, Target 63-10, and the DU library (Figure 1-1). Under the proposed action, the Air Force would employ a suite of optional tools for disposal of DU-contaminated targets and TDMR consistent with the NTTR DU Management Plan (Air Force 2000). Implementation of disposal would begin in 2005 and continue into the foreseeable future with the number of targets disposed of in a given year depending on training tempo and available funding. The Air Force is conducting this analysis to determine the potential environmental impact of the proposed action and alternatives.

Under a license granted in 1982 by the Nuclear Regulatory Commission, the Air Force operates the DU licensed area (Figure 1-2) which encompasses approximately 4 square miles (2,560 acres) including: the active target array (Target 63-10) and the DU library, a holding area for DU targets and TDMR. Target 63-10, consists of a six-tank target array (Figure 1-3) used for firing 30-mm DU rounds by A-10 aircraft for



test and training purposes. These tank targets receive use until deformation prevents evaluation of DU munition entry points, a target loses fidelity, or weapons effects test requires target removal for assessment. Commonly, targets last 5 to 7 years (or as needed). After this use, NTTR places the out-of-service target in the DU library. Approximately 180 out-of-service targets currently reside in the DU library (AFIOH 2003a) in various conditions (from more to less deformed) and security classifications (classified vs. unclassified). In addition, unclassified TDMR is stored in the library and requires disposal. Variation in the condition of targets and TDMR requires that the Air Force adopt flexibility in the methods implemented to dispose of these low-level radioactive materials. The proposed action would employ a suite of methods to decontaminate and reuse targets elsewhere on NTTR, dispose of classified targets contaminated with DU at the Nevada Test Site, or dispose of TDMR and unclassified and/or declassified targets at an approved low-level waste (LLW) disposal facility.

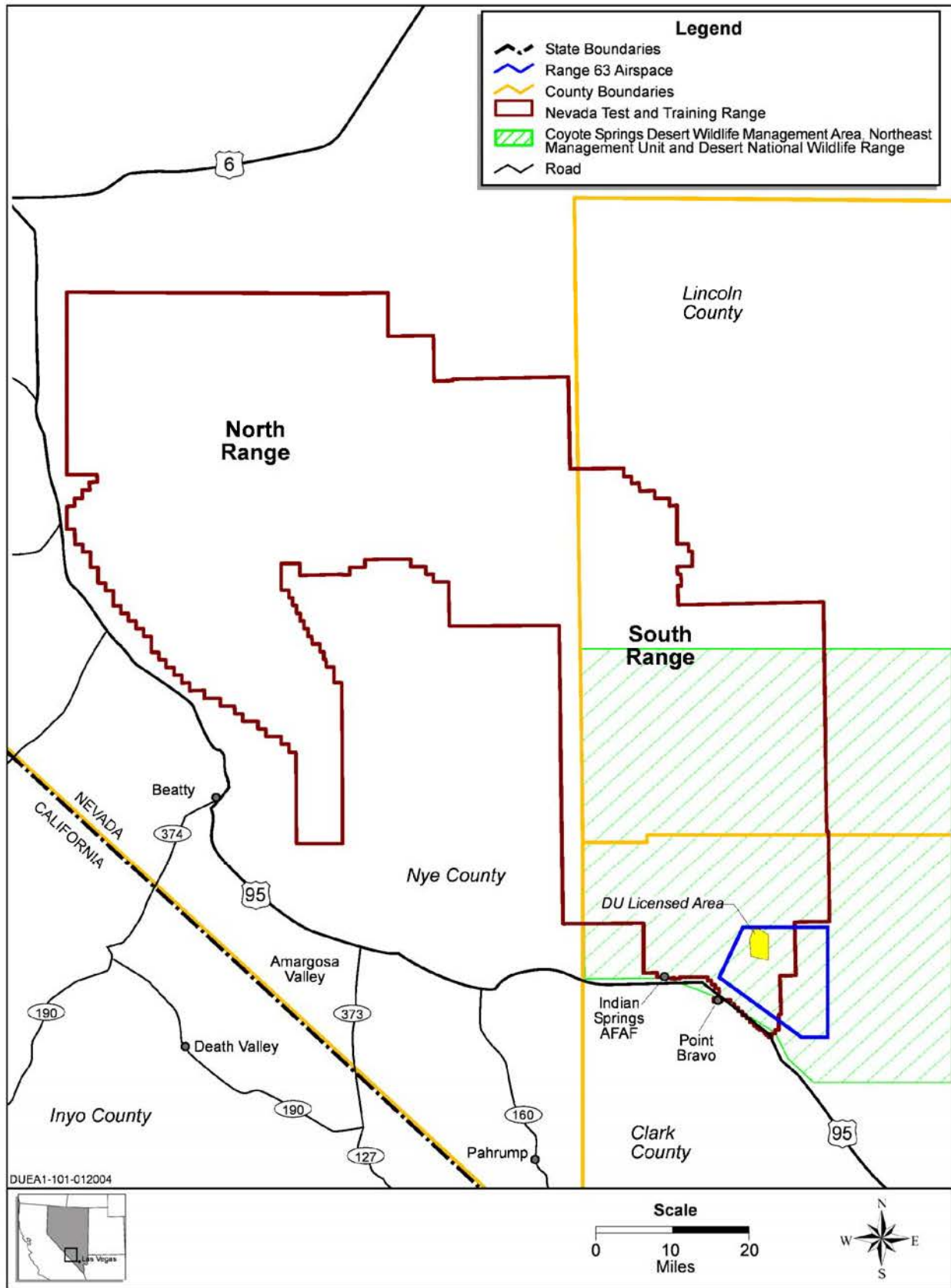


Figure 1-1 Nevada Test and Training Range

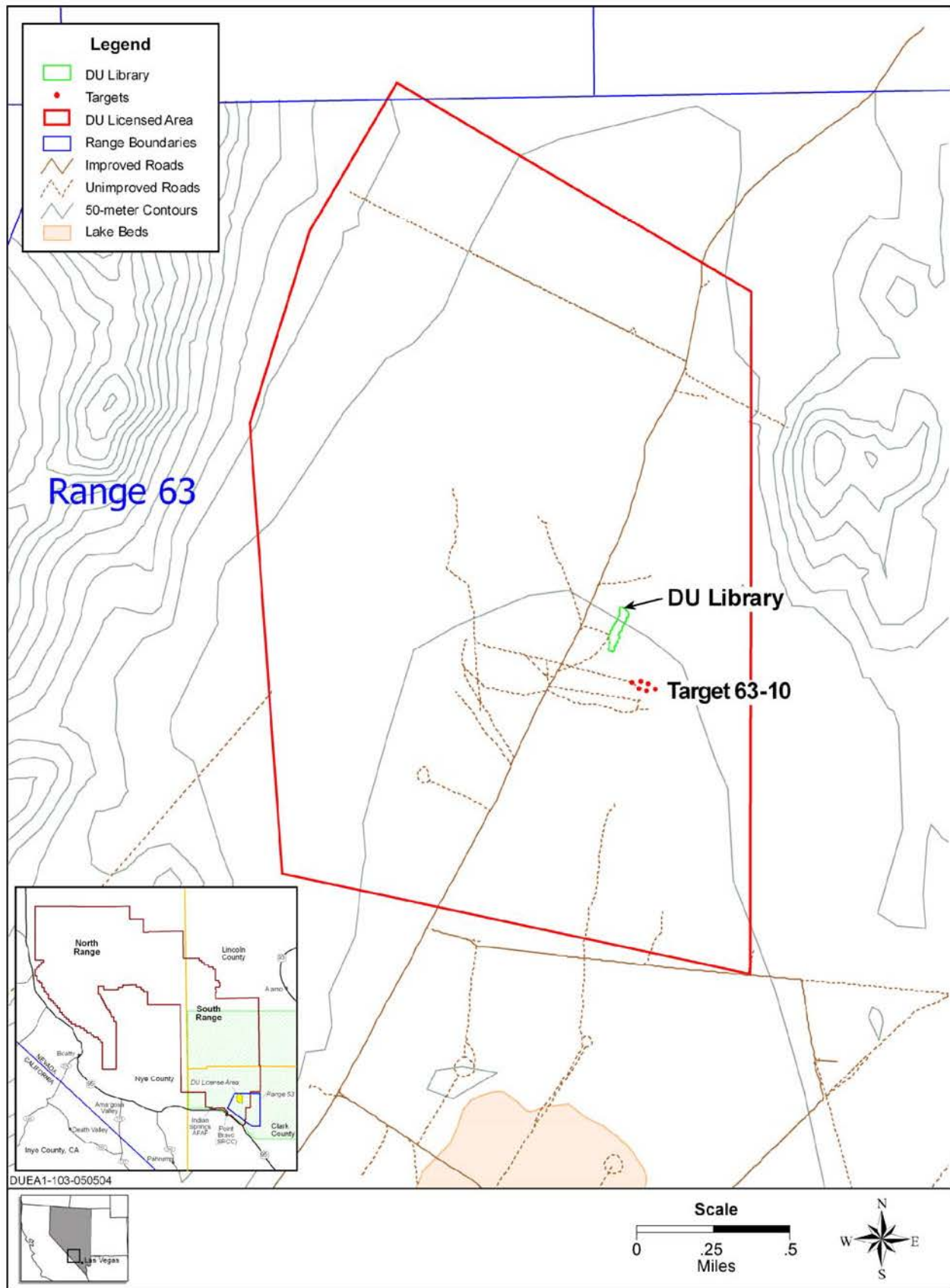


Figure 1-2 DU Licensed Area

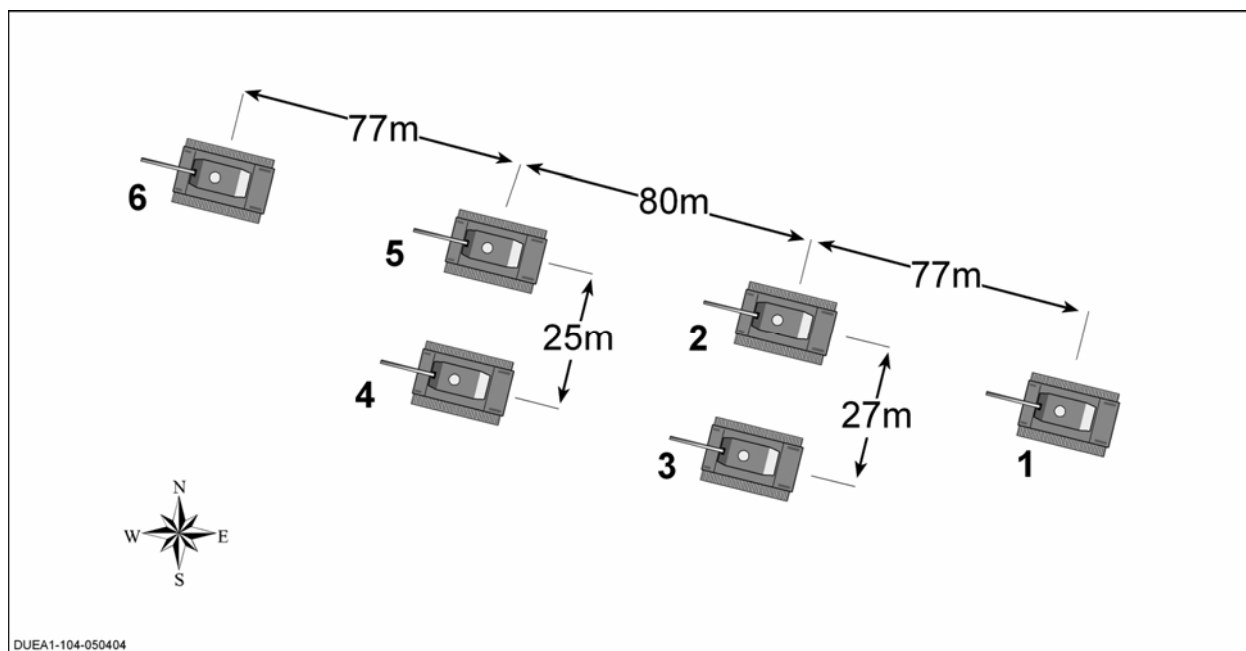


Figure 1-3 Target 63-10 Six-Vehicle Target Array

In addition to the proposed action, the Air Force has analyzed two alternatives: on-site above ground monitoring and no action. Under the on-site above ground monitoring alternative, conditions of the no-action alternative would apply with the addition of air, water, and soil monitoring at the DU library and Target 63-10. Under the no-action alternative, the Air Force would not declassify, decontaminate, or reuse targets, or dispose of DU-contaminated TDMR from the DU library. All targets and TDMR would remain within the DU library and Target 63-10.

1.2 LOCATION OF THE PROPOSED ACTION

NTTR consists of approximately 2.9 million acres in southern Nevada withdrawn from public use as a national test and training area for military equipment and personnel under Public Law (P.L.) 106-65. NTTR comprises two functional areas: the North Range and South Range both of which are further divided into subranges. The DU licensed area and Target 63-10 lie within Range 63 of the South Range (refer to Figures 1-1 and 1-2), approximately 12 miles east-northeast of Indian Springs, Nevada and within a portion of the Desert National Wildlife Range (DNWR).

1.3 BACKGROUND

During the 1970s, the Air Force began researching, testing, and evaluating the applicability of high-density materials such as tungsten and DU to develop improved armor-penetrating munitions capable of defeating heavily armored targets. In 1975, the Air Force completed an Environmental Assessment (EA) entitled *Depleted Uranium (DU) Armor Penetrating Munition for the*

GAU-8 Automatic Cannon Development and Operational Test and Evaluation (Air Force 1975). The EA analyzed the manufacturing, storage, use, and disposal of DU ammunition under a proposal to conduct operational tests and evaluations on targets at the NTTR South Range. In concluding that no aspect of the DU munitions proposal would adversely affect the environment (Air Force 1975), the Air Force began conducting ballistic tests at NTTR South Range. Spanning about 10 months in 1976 to 1977 these tests employed 20-, 25-, and 30-mm DU ammunition in the GAU-8 automatic cannon developed by the Air Force specifically for use in the A-10 close air support aircraft. Based on these tests, the Air Force determined that the 30-mm round would best meet Air Force and A-10 mission needs (Global Security 2003).

Following selection of the 30-mm cannon, the Air Force recognized the need to establish an exclusive area to support testing, training, and development of the DU munitions and firing systems while ensuring national security and public safety. Existing ranges with available target areas, well-removed from the public, comprised the locations considered for DU munitions activities; Target 63-10 within the NTTR South Range met these criteria. In 1982, the NRC granted a license to the Air Force to use Target 63-10 for firing 30-mm DU rounds on targets “in quantities as needed for pilot training and tactical employment evaluation” (Air Force 1998a) in the area encompassing Target 63-10 and the DU library. DU testing and evaluation continued on Target 63-10 from 1982 until 1993 when the U.S. Fish and Wildlife Service (USFWS) requested the Air Force suspend use of DU due to concerns for vegetation and wildlife in the DNWR.

During the period spanning 1976 to 1977 and 1982 to 1993, the A-10s fired approximately 90,000 DU rounds at Target 63-10; an average of 7,500 rounds per year. While the USFWS offered no evidence that DU munitions use on Target 63-10 posed a threat to the environment, the agency’s concerns prompted the Air Force to evaluate its potential effects in 1993. Realizing the critical need to continue DU munitions testing and training, Nellis Air Force Base (AFB) conducted a site assessment of soils and water in 1994 to determine the general locations and conditions of DU penetrators (i.e., spent munitions) and potential DU residues in an effort to address the USFWS concerns. In addition, Nellis AFB used these studies to develop a management approach for Target 63-10 (Air Force 1994). The results of the studies, as detailed later in this section, revealed no effects to soils, water, air quality, wildlife, or plants. When provided with these results, the USFWS agreed with the Air Force findings and DU use at Target 63-10 resumed (USFWS 1997).

The Air Force completed an EA for resuming DU use on Target 63-10 with a Finding of No Significant Impact (FONSI) in 1998 (Air Force 1998b). In 2000, the Air Force approved a management plan for Target 63-10 and the DU library (Air Force 2000). By 2002, the Air Force resumed use of Target 63-10, the only remaining air-to-ground gunnery range in the United States licensed for DU use. Analyzed levels of use totaled 7,900 30-mm DU rounds per year, an amount similar to that fired each year of use since the establishment of the target in the 1970s.

Target 63-10 and the DU library operate under a Master Materials License 42-23539-02/02AFP issued by the NRC and a Material Permit NV-30048-02/02AFP (2004) regulated by the Air Force Radioisotope Committee (RIC). Authority is granted to the Air Force to receive, possess, transfer, and store DU munitions and materials in AFI 40-201, *Managing Radioactive Materials in the U.S. Air Force*. The Nellis AFB 98 Range Squadron manages and maintains Target 63-10 and the DU library. While Nellis AFB Bioenvironmental staff assists with evaluating the condition of the targets and DU licensed area, the Air Force Institute for Operational Health (AFIOH), under the jurisdiction of the RIC, is responsible for monitoring radioactivity.

1.3.1 Use and Condition of DU Targets and Library

Every 5 to 7 years, or as needed, targets are replaced in the target array when test, training, and evaluation staff can no longer effectively evaluate the DU penetrator entry points or the targets lose fidelity and realism. In special circumstances, the Air Force may replace targets more often to support weapons effect testing. Approximately 180 tank and vehicle targets currently within the DU library manifest varying degrees of contamination from DU penetrator entries, ricochets, and penetrator splatter fragments within tank hulls; many targets still retain



sufficient fidelity to serve as replacements in the target array, but not all would be needed for future DU munitions training and testing. Under current rates of use, NTTR management estimates that the targets available as replacements exceed future needs by more than double (personal communication: Schofield 2004, Anderson 2004).

To manage the DU library safely and effectively, targets receive a unique numerical identifier, a label with “Caution Radioactive Material” and an entry in a database (Air Force 2000). This tracking system permits categorizing the targets according to reuse potential and security classification. Items considered classified under *Joint Munitions Effectiveness Manual, Air-to-Surface Weapon Engineering System* (JAWS 2003) reveal DU target penetration information such as munition delivery accuracy, sensitivity of the target vulnerability, and weapons reliability.

1.3.2 Depleted Uranium and Low Level Waste

DU predominantly results as a byproduct of the process of enriching natural uranium for use in nuclear reactors; reprocessing of spent nuclear fuel accounts for a minimal amount of DU (Military Analysis Network 2004). Natural uranium, a slightly radioactive metal present in most rocks and soils, consists primarily of a mixture of two isotopes: U-235 and U-238. Within a volume of natural uranium, U-235

and U-238 account for 0.7 and 99.3 percent, respectively. Since reactors require U-235 to produce energy, processing of the uranium involves enrichment to obtain U-235 by removing most of the U-238. Processing converts U-238 into DU, a substance 40 percent less radioactive than natural uranium. With a half-life of 4.5 billion years and low radioactivity, little decay of DU materials occurs (Military Analysis Network 2004). A half life represents the time necessary for half of the radioactive element in a material to decay. However, the long half-life of DU neither implies radioactive potency nor potential for harm. Rather, as noted previously, DU emits less radioactivity than natural uranium and it decays very slowly (NRC 2002). DU is used for ballast in ships, aircraft counterweights, x-ray shielding, and other purposes as well as for munitions.

As a result of DU munitions for testing and training, radioactive contamination affects targets and TDMR at Target 63-10 and in the DU Library. A survey of the targets in the DU library (AFIOH 2003c) revealed varying extents of radioactive contamination, and all of the contaminated targets and TDMR constituted LLW. LLW is defined as any radioactive waste not classified in one of three other categories: high-level waste (i.e., spent nuclear fuel or highly radioactive waste from reprocessed spent fuel); uranium milling tailings; and waste with greater than specified quantities of elements heavier than uranium (Fentiman *et al.* 2003). Since LLW includes the materials and objects that have become contaminated with radioactivity, the tank targets and TDMR at Target 63-10 and the DU library constitute LLW.

As detailed later in Section 1.3.3, DU-contaminated targets and TDMR can be disposed of at licensed commercial sites or at an authorized DOE facility. Air Force Material Permit NV-30048-02/02AFP contains a specific condition that allows transfer of permitted DU material to DOE or to an NRC licensee with a valid authorization to receive the material. Authority to transfer the contaminated targets and TDMR is found in 10 CFR 40.51(b)(1) which specifies that a source material licensee, or permittee, may transfer source material to the DOE, subject to the verification provision in § 40.51(c) and the allowable methods in § 40.51(d). In addition, 10 CFR 40.51(b)(5) specifies that a source material licensee may transfer source material to any specific or general licensee authorized to receive the material, subject to verification that the licensee is either licensed or registered to receive the material.

1.3.3 Existing Management Plan

The Air Force approved the NTTR DU Management Plan for Target 63-10 in 2000 following the decision to resume use of 30-mm DU rounds (Air Force 1998b). The plan provides guidance for disposition and handling of contaminated (i.e., low-level radioactive materials) targets and TDMR based on factors that include security classification, level of contamination, regulatory requirements, and cost. To evaluate these factors, the Air Force must employ a step-by-step process. As outlined in Figure 1-4, the process first determines if the target warrants classified handling then considers its potential for decontamination.

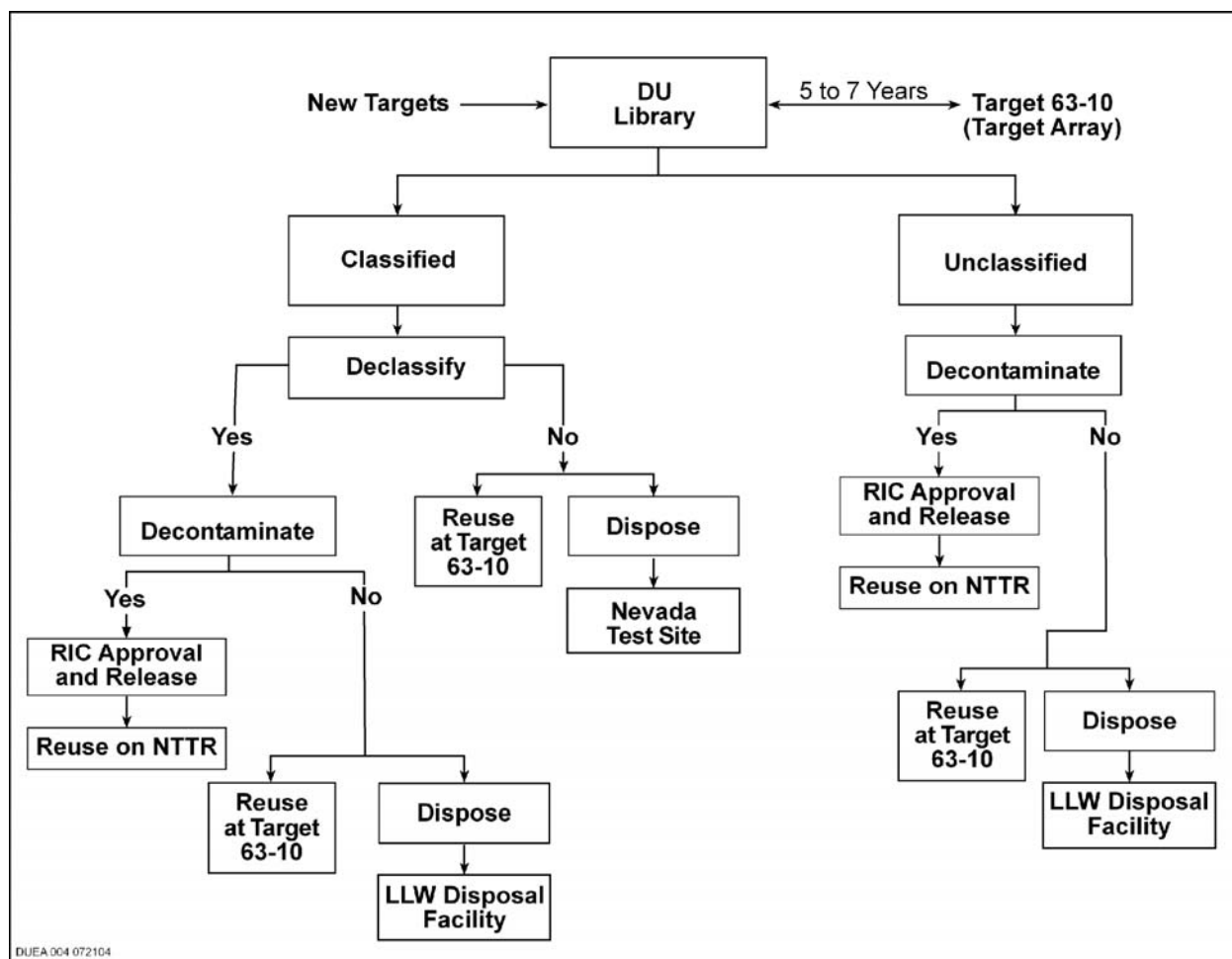


Figure 1-4 DU Target and TDMR Disposal Process

If classified, the process calls for an assessment of the potential to declassify the target by removal of the affected portions. Current assessments in the DU Library demonstrate little to no opportunity to declassify such targets (Anderson 2004). In that case, the targets must either be reused on Target 63-10 or disposed of at a facility approved to accept classified LLW. Currently, the DOE's Nevada Test Site (NTS), a 1,375-square mile restricted complex encompassed by NTTR, represents the only facility authorized to accept classified LLW. Operated by the National Nuclear Security Administration (NNSA), NTS includes Area 5 which accepts classified LLW such as the tank targets in accordance with the NTS Waste Acceptance Criteria and associated processes (DOE 2003). As noted previously, transfer of this classified LLW to the NTS is permitted under Air Force Material Permit NV-30048-02/02 AFP and 10 CFR 40.51(b)(1).

Unclassified or declassified targets can be disposed of at any approved LLW facility. Many of these approved facilities currently exist throughout the United States, and others may open in the future (NRC 2002). All such facilities must operate in accordance with the Low Level Radioactive Waste Policy

Amendments of 1985 and associated federal and state regulations. Under this act, states remain responsible for overseeing LLW disposal.

Targets with only surface contamination can be decontaminated by removing (with metal cutting torches or pneumatic needle) the contaminated areas or plugs. The DU management plan calls for the contaminated plugs to be sent to an approved LLW disposal facility. If decontamination permits certification of a target as “radiation free,” and after approval by the RIC, it can be released for unrestricted use elsewhere on NTTR.

To release a target for unrestricted use, radioactive contamination must register below the contamination levels established by the U.S. Atomic Energy Commission Regulatory Guide 1.86 (USAEC 1974; AFIOH 2003c). Regulatory Guide 1.86, which was developed by the Atomic Energy Commission in 1974, provides a table of acceptable surface contamination levels for various radionuclides, including natural and enriched uranium, transuranics, and fission products. These surface contamination levels are stated in terms of measurable radioactivity levels (observed disintegrations per minute per 100 square centimeters of surface area), the values of which were based principally on the capabilities of readily available instrumentation at the time the guide was developed. Regulatory Guide 1.86 does not contain dose criteria. Under the regulatory guide, an average surface contamination level of 5,000 DPM or less indicates that the material qualifies for free release and unrestricted use. Only a few targets within Target 63-10 and the DU library appear to qualify for reuse (AFIOH 2003c). Prior to free release and unrestricted use, the Air Force’s RIC must approve the action.

According to the plan, targets that cannot be decontaminated because the DU fused into large areas of the metal must be packaged and transported to a LLW disposal facility. These activities would be implemented in accordance with AFI 40-201 and AFI 13-212V1 *Range Planning and Operations*. In addition, the Air Force would follow 10 CFR 71, *Packaging and Transportation of Radioactive Materials* and Department of Transportation (DOT) guidelines promulgated in 49 CFR 106, 107, and 171-180 *Transportation*. Contaminated but salvageable targets would remain in the DU library for future reuse at Target 63-10. Again, any targets considered for unrestricted reuse must meet the criteria in Regulatory Guide 1.86 and receive approval from the RIC. TDMR is considered unclassified and unsalvageable. To comply with AFI 40-201, the Air Force requires a Health and Safety Plan (HASP) prior to removal of targets or TDMR. Also, as required by AFI 40-201, the Installation Radiation Safety Officer must coordinate these activities through the Air Force Radioactive and Mixed Waste Office (AFRMWO) and the Air Force Institute for Operational Health (AFIOHA/SDRH).

1.3.4 Depleted Uranium Studies

DU’s effects on human health and the environment form a topic of interest around the world. From scientific studies, several conclusions pertinent to the proposed action can be drawn:

- Natural uranium occurs throughout the environment.
- DU is 40 percent less radioactive than natural uranium.
- Civilian uses of DU include counterweights in aircraft, ballast in ships, and shielding in medical radiation therapy machines.
- DU concentrations from penetrators do not pose a contamination risk to humans, air, water, soils, plants, or animals.
- DU dust disperses in the immediate area of the target only during impact.
- DU, as employed at Target 63-10 and held within the DU library, does not adversely affect the environment and human health.

The following summarizes the results of general and NTTR-specific studies of DU use. In addition to the studies and reports summarized below, two EAs (Air Force 1975 and 1998b) analyzed DU use on biological and human resources at DU Target 63-10. Both assessments concluded that DU use on Target 63-10 would not adversely effect the environment and that DU contamination would remain localized in and near the target array.

General

Long-Term Fate of Depleted Uranium at Aberdeen and Yuma Proving Grounds Phase I: Geochemical Transport and Modeling, June 1990 (Ebinger *et al.* 1990). Studies conducted at Aberdeen and Yuma Proving Grounds, two distinctly different environments, sought to develop an understanding of the distribution and transport of DU in soil and water contexts and to identify potential chemical property changes of DU. This study focused on determining if remediation of sites used for DU munitions training would be required. The conclusions indicate that while erosion and rain events could transport DU, further studies would be required to establish the probability and scope of such transport.

Long-Term Fate of Depleted Uranium at Aberdeen and Yuma Proving Grounds Phase II: Human Health and Ecological Risk Assessments, September 1996 (Ebinger *et al.* 1996). This study continued to seek further analytical data to answer Phase I study questions while probing potential DU migration into bay waters from Aberdeen Proving Ground. Results from the study indicated: 1) DU migrates very slowly in soil with erosion being the primary mode of DU transport; 2) rainfall events which result in flash flooding could potentially move DU fragments into channels towards larger water bodies; and 3) DU transport posed no adverse affects to ecosystems or humans.

U.S. Army Depleted Uranium Tests Ballistic Research Laboratory Test Site Environmental Assessment, November 1992 (DOE 1992a). Analysis of open-air and closed-tunnel testing at the Nevada Test Site (NTS) concluded DU-contaminated soil settles quickly with minimum dispersion. This 5-year study conducted by the DOE indicated that DU particles did migrate slightly downward in the soil, but over 95 percent of the original DU material left in the soil remained in the top 3 inches of the soil profile indicating minimal erosion and/or percolation of DU materials.

Depleted Uranium in Kosovo, Post-Conflict Environmental Assessment, 2001 (UNEP 2001). In 2000, the United Nations Environmental Program (UNEP) conducted an assessment of potential effects of the use of DU munitions in the Kosovo conflict. The UNEP team examined 11 sites known to have been targets for DU munitions, collecting hundreds of samples for contamination of air, water, soils, milk, and vegetation. Sampling locations included sites with penetrators, as well as numerous locations in the surrounding area to test for contamination dispersal. After lab testing of the samples, UNEP concluded that the analyses of the samples revealed only low, insignificant levels of radioactivity. Furthermore, the results established that contamination had not migrated far from the penetrators or into soil profiles, groundwater, and vegetation. Cows did not uptake DU contamination nor did DU affect milk. The study revealed there are no concerns or impacts regarding toxicity, including heavy metals. Although UNEP adopted a cautious approach, it indicated that the health and environmental risks from DU are insignificant.

Target 63-10 and the DU Library

Report on Target Refurbishment on Range 63, Nellis Air Force Base, Nevada, October 1992 (Air Force 1993). The Armstrong Laboratory Health Physics Function took air and radiation samples during efforts to move two tank targets from Target 63-10 to the DU library. All site personnel were equipped with air samplers, protective clothing, respirators, and gloves. The air monitoring results indicated DU contamination remained localized to the immediate target area and no significant airborne DU contamination occurred during target movement activities.

Depleted Uranium Site Assessment Range 63 – Nellis Range Complex, 1994 (Air Force 1994). This study examined potential migration of DU particles through two air migration scenarios: 1) natural wind dispersion and DU transport during target replacement and 2) heavy equipment disturbance of surrounding soils and surface water migration during thunderstorm events. Initial concerns about potential inhalation of dust from ground disturbance activities associated with target replacement proved unfounded. Use of proper handling procedures and breathing apparatus ensured more than adequate protection. In addition, the study confirmed the extreme density of DU particulates and oxides reduced the dispersion via wind or surface water.

Radiological Scoping Survey of Range 63-10, Nellis Air Force Base, Nevada, December 2001 (AFIERA 2001). Brooks AFB conducted a radiological soil survey of approximately 250 acres to determine the extent of DU contamination and migration in the soil. DU contamination located approximately 1,970 feet from the center of the target array was limited to DU rounds and target fragments. The analysis found little or no migration of DU in the soil in the areas outside of the target array, confirming conclusions reached in prior studies of the site. Indeed, contamination diminished rapidly with distance from the targets, and ceased altogether 350 feet from the target.

Summary Conclusions

While the DU studies and environmental analyses concluded that limited DU migration could occur chiefly through soil erosion, site disturbance, or rain events, results at Target 63-10 indicate DU settles in the soil with minimum dispersal, no indications of DU migration to groundwater resources exists, and radiological contamination remains concentrated within the target array.

1.4 PURPOSE AND NEED FOR NTTR DEPLETED URANIUM TARGET DISPOSAL

Target 63-10 and the DU library have been in existence since the 1970s when Target 63-10 was established for DU munitions training and testing. Target 63-10 was used in the 1970s, 1980s, and into the 1990s. In 1993, the Air Force voluntarily suspended operations at Target 63-10 as part of an agreement with the USFWS. The Air Force completed an environmental assessment with a finding of no significant impact in 1998 (Air Force 1998b). In 2000, the Air Force developed and approved a management plan for Target 63-10 and the DU library (Air Force 2000). Use of this target resumed in 2002 after the Air Force and USFWS (USFWS 1997) concluded that activities had no significant effect on the environment. Target 63-10 comprises the only authorized site in the United States for Department of Defense (DoD) DU air-to-ground testing and training. When the tank targets no longer retain fidelity or allow for recognition of DU penetrator entries, the targets and/or TDMR are removed to the DU library.

Air Force surveys (AFIOH 2003a) indicate that the majority of the approximately 180 DU-contaminated targets and TDMR require disposal from the library. Implementation of a suite of disposal options would allow the Air Force to begin disposing of targets and TDMR from the DU library, consistent with the NTTR DU Management Plan (Air Force 2000) and in accordance with AFI 13-212V1 and AFI 40-201. Disposal would also occur in accordance with Air Force Material Permit NV-30048-02/02 AFP and 10 CFR 40.51(b)(1). Therefore, the purpose of the proposed action is to allow the Air Force to employ a suite of optional tools for disposal of DU-contaminated targets and TDMR. Such an optional suite of tools would meet the need to dispose of targets and TDMR from the DU library while providing sufficient tank targets for continued use of Target 63-10 for testing and training. The tools need to include but not be limited to target decontamination, reuse, transport, and in- and out-of-state disposal locations. The tools also must support appropriate handling and disposal of classified materials. Lastly, the tools must provide flexibility to the Air Force that recognizes year-to-year variations in funding available for disposal.

CHAPTER 2

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

CHAPTER 2

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Air Force proposal to implement a flexible suite of disposal options for DU-contaminated targets and TDMR from Target 63-10 and the DU library. The proposal would permit the Air Force to dispose of targets and TDMR contaminated by 30-mm DU rounds fired by A-10 aircraft for test and training purposes. Implementation of this proposal would further define disposal activities as outlined in the NTTR DU Management Plan (Air Force 2000) and in accordance with AFI 13-212V1 *Range Planning and Operations* and AFI 40-201 *Managing Radioactive Materials in the USAF (U.S. Air Force)*. Under the proposed action, the Air Force would use a suite of methods to decontaminate and reuse targets elsewhere on NTTR; declassify and transport targets and TDMR for disposal to an approved, licensed LLW disposal facility; or transport classified targets to a classified LLW disposal facility (i.e., NTS). Methods employed and final disposition of the targets and TDMR would depend on several factors described later in this section.

In addition to the proposed action, the Air Force analyzed two alternatives. The first alternative would retain all targets and TDMR on-site within the DU library. This alternative would involve long-term above-ground storage accompanied by periodic air, water, and soil monitoring. As required by the National Environmental Policy Act (NEPA) and Council of Environmental Quality (CEQ) regulations, the second alternative consists of no action. Under the no-action alternative, the Air Force would not, at this time, employ methods to evaluate and dispose of targets and TDMR from within the DU library. No change from current conditions would occur as a result of implementing the no-action alternative.

2.1 ALTERNATIVE IDENTIFICATION PROCESS

Three fundamental factors guided alternative identification. First and foremost, any action alternatives needed to adhere to the goals and requirements of: the NTTR DU Management Plan (Air Force 2000); AFI 13-212V1; AFI 40-201, the NRC license authorizing use of DU; and federal and state handling, transport, and disposal regulations for LLW. Secondly, an alternative must be viable within the context of test and training operations at Target 63-10. The Air Force anticipates continuance of such operations into the foreseeable future, so targets must be available for use. Lastly, the varying conditions and classification status of the targets and TDMR in the DU library demand that an alternative provide for flexibility in handling, transport, and disposal.

To address these factors, the Air Force conducted a survey of the targets in Target 63-10 and the DU library. The survey defined the condition, level of contamination, and security classification of each of the targets (AFIOH 2003a). Based on the survey results, the Air Force developed options to provide maximum flexibility in selecting the methods and amount of targets and TDMR for disposal in the

immediate and foreseeable future. The following criteria form the basis for development of a suite of optional disposal tools to meet the purpose and need.

1. ***Target Damage/Condition.*** Evaluating the condition of targets in the DU library identifies how many could potentially be decontaminated and reused versus those requiring disposal. Targets in the DU library reflect a range of damage, with most exhibiting heavy damage and numerous penetrator entries in the hull and elsewhere (AFIOH 2003c). Since heavily damaged targets are in poor condition, they receive no consideration for decontamination or reuse. Moderately damaged targets would be considered for reuse at Target 63-10 but would not warrant decontamination for use elsewhere on NTTR. Lightly damaged targets in good condition represent candidates for decontamination and reuse elsewhere on NTTR if the contamination can be easily removed and the target certified for free release (i.e., “radiation free”) by the RIC.
2. ***Target Classification.*** Under the *Joint Munitions Effectiveness Manual, Air-to-Surface Weapon Engineering System* (JAWS 2003), DU target penetration information such as munition delivery accuracy, target vulnerability, and weapons reliability is classified. To protect this information, the suite of tools must ensure all classified targets are either sent to a classified LLW disposal facility (i.e., NTS) or retained on-site at the DU library. Unclassified or declassified targets, depending upon their condition and contamination levels, become eligible for either free release and reuse at NTTR (decontaminated) or disposal at an approved, but unclassified LLW facility. TDMR exhibits no classified characteristics, so the tools must allow for its disposal at a LLW facility.
3. ***Level of Contamination.*** All targets require evaluation of the level of contamination and its extent, with the results of such an evaluation dictating options for disposal. Since all of the targets and TDMR in the DU library exhibit some degree of DU contamination (AFIOH 2003c), methods to allow reasonable attempts to remove contamination from targets in good condition must form part of the action. Conversely, the tools need to permit the Air Force to preclude decontamination efforts on targets where contamination extends throughout large areas or affects joints and seams. In sum, the suite of tools must support differentiated treatment and disposal based on the level and extent of contamination and security classification. Due to the expense associated with decontaminating targets in moderate to poor condition, the Air Force considers only targets in good condition for decontamination and/or reuse. The presence of multiple contamination points from penetrator entries, splatters, and ricochets exclude moderate to heavily



damaged targets from decontamination. TDMR offers no potential for decontamination and reuse.

Application of these criteria led the Air Force to identify the proposed action, an on-site above ground storage and monitoring alternative, and the no-action alternative. The proposed action, implementation of a flexible suite of disposal methods, fulfills all aspects of the three factors. Although on-site above ground storage and monitoring alternative adheres to these factors, it involves a more limited approach than the proposed action. Under the no-action alternative, no disposal would occur at this time, and the need for this action would not be met.

2.2 PROPOSED ACTION

The Air Force has determined that targets and TDMR in the DU library require disposal. To meet this goal, the proposed action would implement optional methods for disposal of the DU-contaminated targets and TDMR (refer to Figure 1-4), permitting the Air Force to adjust annual disposal activities based on operations and funding.

Under the proposed action, the Air Force would employ strict handling, transport, and disposal measures for the contaminated targets and TDMR in the DU library. Such measures are defined by permits, regulations, and guidelines from the Air Force, DOE, NRC, DOT, DoD, Environmental Protection Agency (EPA), and transport requirements for the State of Nevada. The Air Force has instructions for processing radioactive materials for packaging and transport that consider the safety and protection of the military and general public. AFI 40-201 *Managing Radioactive Materials in the USAF (U.S. Air Force)* defines the requirements for packaging and transport of radioactive material, radioactive waste management, and radioactive materials disposal. Air Force guidelines for packaging and transport of radioactive waste materials from the site of use or on public highways as promulgated in 10 CFR 71, *Packaging and Transportation of Radioactive Material* and 49 CFR, *Transportation* would be implemented. Packaging would also conform to Nevada Administrative Code (NAC) 459.830. Air Force procedures for packaging and transport of LLW are in compliance with DOT, DOE, and EPA regulations.

Based on existing evaluations, more than half (55 percent) of the targets require treatment as classified materials and most (90 percent) do not qualify for decontamination or free release. Although not classified, all TDMR would require disposal.

Implementation of different combinations of tools over the duration of the disposal process would stem from several factors. Training needs, tempo, and available funding would dictate annual disposal efforts. Each tool is described below, with the full disposal process outlined previously in Figure 1-4.

Declassify – DU target penetration information is classified. Procedures for declassifying a target would include cutting the classified portion of the target out using a metal cutting torch or other appropriate device. The resultant cut would render the plug or remnant section, as well as the rest of the target, unclassified (Anderson 2004).

Decontaminate – Targets with light damage would be considered for decontamination. Modes of decontamination include removing surface splatter with a pneumatic needle gun, cutting out small areas of contamination with a torch, and grinding out areas of surface contamination. Each of the mechanical methods would include use of a High Efficiency Particulate Air (HEPA) filter vacuum to capture dust and particles. Dials and gauges would be removed. Radiological testing would be performed to determine if all contamination had been removed. The techniques would be applied until a viable target could be certified “radiation free” by the RIC. Radiation free certification would be required to meet or exceed U.S. Atomic Energy Commission (USAEC) Regulatory Standards for release of decontaminated materials for unrestricted use (USAEC 1974).

Although commonly removed prior to placement in the DU library, small amounts of lubricants, fluids, batteries, and other similar materials may remain within the tank target. While existing NTTR procedures require removal and appropriate disposal of such materials prior to acceptance of a target at the DU library, old targets may contain some of these materials (personal communication, Schofield 2003). If so, the Air Force would ensure their removal prior to transport for disposal or reuse on NTTR. Such materials would be handled and disposed of consistent with current NTTR practices (Air Force 2003a) which likewise conform to state and federal laws and regulations.

Reuse on NTTR – Decontaminated and unclassified targets would be eligible for free release and use elsewhere on NTTR for conventional target delivery. All contamination would be removed and the target designated “radiation free” by the RIC. As noted previously, this would include removal of dials and gauges, as well as checking for and removal of fluids, batteries, and other like materials. Targets would be loaded onto a tractor-trailer and transported to the desired target site or target staging area.

Reuse at Target 63-10 – Some targets may be in sufficient condition to be considered for reuse at Target 63-10. These targets would not require decontamination or declassification, and would be towed from the DU library to the target array. Heavily damaged targets or those lacking fidelity would be excluded from reuse and slated for disposal.

Transportation – Transport of targets and TDMR from the DU library would comply with DOT material packaging regulations as specified under 49 CFR Chapter 1, Subchapter C, Subpart D, *Marking*, and Subpart K, *Specifications for Packagings for Class 7 (Radioactive) Materials* and

regulated under 10 CFR 71, *Packaging and Transportation of Radioactive Material*. Nevada regulates packaging under NAC, Chapter 459, *Hazardous Materials*, particularly, NAC 459.830, *Requirements for Physical Form and Packaging for all [Radioactive Material] Classes*. In addition, AFI 40-201, covering handling, packaging, and transport of LLW would be implemented.

Prior to transport, the Air Force would implement the packaging and preparation procedures in accordance with the regulations noted above. All tank and vehicle targets regardless of facility destination would be drained of fluids prior to being loaded onto trailers. Whole targets would be shrink-wrapped, sprayed with a polymer sealant, or containerized. Shrink-wrap is a protective wrapping of a plastic film shrunk by a heat-gun to form a sealed, tight fitting package. With the seal, dust and all other small particles would adhere to the target surface and be prevented from dispersing. The low-boy trailer containing the tank would then be covered by a tarp and secured via tie-downs. Alternatively, whole targets would be containerized and secured to a low-boy if necessary. Like shrink-wrapping, containerizing would prevent any escape of contaminated materials. TDMR and target sections would also be containerized, sealed, and loaded onto trailers for transport. Each package would be marked and labeled as required in 49 CFR regulations.

Once packaged, each target or load of TDMR would undergo a radiation survey. This survey, conducted in accordance with Air Force, DOT, and Nevada regulations, examines the packaged items with Geiger counters and other equally sensitive detection devices to ensure no leakage or escape of radiation. Should radiation be detected, the Air Force would re-package or re-seal the item. Until the materials for transport pass this inspection, they would not be permitted off-site.

Loading would utilize a crane or forklift of appropriate size to place a 25-ton tank on the trailer. To the degree feasible, placement of a crane or forklift and loading of the tank targets and TDMR would occur within the DU library, as close to the item as possible. Under some circumstances, a tank may need to be dragged from its location to an open spot within or near the DU library where preparation, packaging, and loading would occur. Overall, the Air Force anticipates affecting no more than 1 acre during an annual session of loading. The DU library area already exhibits the effects of disturbance from placement and movement of targets over the past 28 years of use.

After transiting the 15 miles from the DU library to U.S. Highway 95 (U.S. 95), the trucks would proceed to an unclassified LLW facility or NTS via state and federal highways in accordance with 10 CFR 71, packing and transporting of radioactive materials and applicable state laws. Both DOE (DOE 2004) and DOT's National Hazardous Materials Route Registry (DOT 1992) identify highways and roads designated for use for LLW and hazardous waste transportation.

Criteria used to select routes for the registry include: roadway configuration; safety/accident risks; radiation exposure potential; public health and economic risk; emergency response and evacuation capabilities; and special facilities along route (DOT 1992). Carriers transporting shipments from the DU library would employ such routes and operate in accordance with 10 CFR and 49 CFR.

Classified targets would be transported to NTS, traveling approximately 25 miles north on U.S. 95. This and other transport within Nevada would comply with NAC 459.9865. Under this requirement, the Air Force would ensure that the transporter of the LLW would notify the Nevada Highway Patrol Division of the Department of Public Safety not less than 4 hours nor more than 48 hours before transport begins in Nevada. While the transporter would maintain responsibility for selecting a route and complying with transport regulations, the Air Force would reinforce compliance with the requirements through contract.

Use of railroads for transporting the tank targets and TDMR to disposal facilities could occur. Many disposal facilities offer rail access. After truck transport from the DU library to an intermodal yard like one in Barstow, California, the shipment would be transferred to rail cars. As with highways, rail routes have been identified for safe transport of LLW by DOT and the State of Nevada (DOT 1992).

Disposal Facility – To dispose of the tank targets, contaminated cut-outs, and TDMR, the Air Force would need to use two types of facilities. The first type must be licensed to accept unclassified LLW, including DU. Several disposal facilities capable of and licensed to accept LLW as well as hazardous waste operate throughout the western United States. The possibility exists that throughout the duration of the proposed action, other facilities may come into operation. For this reason, the Air Force would not select a particular disposal facility as part of the proposed action. Rather, the Air Force recognizes that any appropriately licensed facility would meet the need of disposal, and other factors (e.g., cost, capacity) would dictate the choice of facility.

Each of these LLW disposal facilities operates under its own permit and license, using its own DOE-authorized waste acceptance criteria and procedures for radioactive and hazardous waste. The Air Force would ensure that all shipments from the DU library would meet applicable DOE and DoD orders, 10 CFR, and 49 CFR requirements, in addition to withstanding stresses associated with shipment processing (i.e., loading, handling, lifting, and transport).

For classified LLW, the disposal requirements differ somewhat. First and foremost, only one location in the United States, the NTS, accepts classified LLW. The NTS also operates under comprehensive and complex waste acceptance criteria designed to provide permanent, secure

disposal of these materials. Under these criteria, only those generators already approved by the NNSA (DOE 2003) may ship classified waste to the NTS. At present, NTTR lacks generator status for NTS, but plans to gain such approval in the future. In the interim (prior to gaining NTS generator status) NTTR would transfer the first shipment of targets and TDMR to NTS under the U.S. Army's Aberdeen Proving Ground approved generator status (Scofield 2004). NTTR would handle subsequent shipments under its own generator status. The capability to transfer DU-contaminated material to a DOE or NRC facility is found in the Air Force Material Permit NV-30048-02/02 AFP and 10 CFR 40.51(b)(1). NTS qualifies as such a facility.

Although both unclassified LLW disposal facilities and NTS operate under different specific procedures, the basic components mirror one another. First, with LLW, a generator must classify the waste based on its radioactive characteristics as defined in 10 CFR 61. The targets and TDMR comprise Class A waste with the lowest radioactivity and, therefore require the least stringent disposal measures.

Second, a generator must characterize the waste stream producing the LLW and develop a waste profile. In the case of the tank targets and TDMR from the DU library, NTTR must determine the waste characteristics of the entire object. The Air Force's policy of ensuring removal of any oils, lubricants, batteries, and the like remaining in the target or TDMR would further reduce the potential for its characterization as mixed waste. Mixed waste consists of a mixture containing a hazardous waste component as defined under the 1976 Resource Conservation and Recovery Act (RCRA) and source, special nuclear, or by-product material subject to the Atomic Energy Act (AEA) of 1954 (42 U.S.C. 2011 et seq. Not all radioactive material is subject to the AEA. Hazardous waste possesses characteristics of ignitability, corrosivity, reactivity, or toxicity.

Another potential source for hazardous waste consists of paint on the tanks or materials used to construct the tanks. These too require characterization prior to disposal in order to determine if the waste could leach toxic chemicals into groundwater. To assess leachability and evaluate chemical toxicity levels, the EPA requires a test known as the toxicity characteristic leaching procedure, or TCLP. Under TCLP, a generator collects a representative sample of the material. RCRA defines a representative sample as "a sample of a universe or whole (e.g., waste pile, lagoon, ground water) which can be expected to exhibit the average properties of the universe or whole." The sample, a pulverized solid waste, is mixed with a dilute acid solution to simulate potential conditions at the base of a disposal landfill. If analysis of the residue determines it contains one or more of 40 listed substances (e.g., arsenic, lead, mercury) in greater than permitted concentrations, the waste is characterized as hazardous under RCRA.

At 40,000 to 50,000 pounds, the DU-contaminated tank targets consist predominately of steel with minor amounts of other metals (Air Force 2004b). Other substances (e.g., lead-based paint)

that may occur on the tanks would likely account for such small concentrations that they would not meet the threshold levels for hazardous waste or mixed LLW.

Third, disposal facilities require that shipments meet packaging and preparation standards. NTS documentation (DOE 2003) provides a representative example of these standards, addressing radiation safety, package configuration and structure, shielding, size, weight, and labeling. In addition, the generator of the LLW must prepare thorough documentation of the source, age, nature, weight, and size of the contaminated materials. Such documentation shall be provided to the disposal facility to demonstrate chain-of-custody and assure compliance.

Disposal Timing – Annual Air Force funding for disposal or clean-up of DU targets and TDMR would drive the number of targets (i.e., 8, 10, or 12) to be addressed for disposal. It is anticipated that disposal efforts would coincide with the annual range cleanup and would occur over roughly 1 month. Implementation of disposal would begin in 2005.

2.3 ON-SITE ABOVE GROUND MONITORING ALTERNATIVE

Under this alternative, all aspects of the no-action alternative would be implemented in addition to performing air, water, and soil monitoring at the DU licensed area. Targets and TDMR would also be monitored for deterioration. Targets and TDMR would remain within the DU licensed area; no disposal or reuse would occur.

2.4 NO-ACTION ALTERNATIVE

In conformance with CEQ regulations (40 CFR 1502.1(d)), this EA also analyzes the no-action alternative. Under the no-action alternative, the Air Force would not dispose of DU-contaminated targets and TDMR from the DU library at this time. Targets could be added to or taken from the DU library for reuse on Target 63-10, but no targets would be moved outside the boundaries of the DU licensed area.

2.5 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This EA examines the potential environmental impact of implementing a suite of tools for disposing of DU-contaminated targets and TDMR from the DU library. The analysis considers the potential effects of the proposed action, and compares those to current conditions under the no-action alternative. This EA also analyzes an additional alternative: on-site above ground monitoring. The steps involved in the environmental impact analysis process (EIAP) used to prepare this EA are outlined below.

1. *Announce that an EA will be prepared.* A Notice of Intent was published on March 8, 2004, in the *Federal Register*.

2. *Conduct Scoping.* Scoping was the first step in identifying relevant issues to be analyzed in depth and eliminating issues that were not relevant. For this process, comments were solicited from the public in the region associated with the proposed action. This includes individuals who had expressed interest in previous Nellis AFB actions; local governments; federal and state agencies; American Indian tribes; and interest groups. During the week of March 8, 2004, the Air Force sent out Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) letters to announce the Air Force's proposal and planned scoping meetings and to request input from government agencies (Appendix A contains the IICEP correspondence).
3. *Prepare a draft EA.* The first comprehensive document for public and agency review is the draft EA. After relevant issues were identified in scoping, the environmental impacts of each alternative, including the no-action alternative, were analyzed.
4. *Announce that the draft EA has been prepared.* The Air Force placed an advertisement in newspapers local to the proposed action, notifying the public as to the draft EA's availability for review in a local library. A public notice of document availability was published September 23, 2004. The notice appeared in the following newspapers: Desert Valley Times; Las Vegas Review-Journal/Sun; Lincoln County Record; Pahrump Valley Times; Reno Gazette Journal; and Tonopah, Times Bonanza & Goldfield News.
5. *Provide a public comment period.* The goal during this process is to solicit comments concerning the analysis presented in the draft EA. The 30-day public comment period began with the date of notification of the document availability in the local newspapers.
6. *Prepare a final EA.* Following the public comment period, this final EA was prepared. This document is a revision of the draft EA, includes consideration of all public and agency comments, and provides the decisionmaker with a comprehensive review of the proposed action and the potential environmental impacts.
7. *Issue a Finding of No Significant Impact.* The final step in the process is signature of a FONSI, if the analysis supports this conclusion, or a determination that an Environmental Impact Statement would be required for the proposal.

2.5.1 Scoping and Public Involvement

Scoping. The Air Force held scoping meetings in Las Vegas, Indian Springs, and Pahrump (March 23 through 25, 2004 respectively). Advertisements were placed a week before the meetings in the following newspapers: *Las Vegas Review Journal*, *Las Vegas Sun*, and *Pahrump Valley Times* described the

proposal and alternatives. The meetings, conducted in an open-house style extended from 6:00 pm to 8:00 pm. A total of 40 persons attended the three meetings, with a total of six comments received during the 30-day scoping period. One commentor asked about the air monitoring that has occurred, wanted more detail on the flora at the range, and asked about procedures for an accident involving DU. Another suggested locations for placing public notices for future meetings. Three commentors asked specific questions about disposal, monitoring, transportation, potential for accidents, and effects at the disposal sites. Another commentor requested more information on DU at NTTR, information on particulate matter, and requested that DU rounds and targets should permanently remain in place at the DU licensed area. All of these comments received consideration in the preparation of the draft EA.

Public and Agency Comments on the Draft EA. The draft EA was published on September 21, 2004. Approximately 75 copies of the draft EA were distributed to agencies, the public, and repositories. The public comment period lasted from September 23 to October 22, 2004. The Air Force received eight letters from federal and state agencies and members of the public including the State of Nevada, U.S. Fish and Wildlife Service, and the Nellis AFB Native American Program. In addition, the NRC and RIC received and reviewed the draft EA. The public and agency comments provided input for change to and clarification of this final EA.

2.5.2 Permit Requirements

This EA has been prepared in compliance with the National Environmental Policy Act, other federal statutes, such as the Clean Air Act, the Clean Water Act, Endangered Species Act, and the National Historic Preservation Act, Executive Orders, and other applicable statutes and regulations. In addition, the Air Force would adhere to all guidelines for packaging and transport of radioactive waste materials as promulgated in the 10 CFR 71, *Packaging and Transportation of Radioactive Materials* and DOT guideline promulgated in 49 CFR 106, 107, and 171-180, *Transportation*. All disposal efforts would comply with the requirements of the NRC license and radioactive material permit.

2.6 MITIGATION MEASURES

In accordance with 32 CFR 989.22 the Air Force must indicate if any mitigation measures would be needed to implement the proposed action or any alternative selected as the preferred alternative under this environmental assessment. For purposes of this EA, no mitigation measures are proposed to arrive at a finding of no significant impact if the proposed action were implemented at NTTR.

2.7 SUMMARY OF IMPACTS

This EA provides an analysis of the potential environmental impacts resulting from implementing the proposed action or action alternative. Six resource areas were evaluated in detail to identify potential

environmental consequences: air quality; soils and water resources; hazardous and radioactive materials and waste; health and safety; biological resources; and cultural resources. Table 2-1 below summarizes and compares the potential impacts for the proposed action and alternatives. As this summary demonstrates, neither the proposed action nor either alternative would result in significant impacts.

| Table 2-1 Comparison of Alternatives by Resource and Potential Environmental Consequences | | |
|---|---|---|
| <i>Proposed Action</i> | <i>On-Site Above Ground Monitoring Alternative</i> | <i>No-Action Alternative</i> |
| Air Quality | | |
| Additional emissions of the following criteria pollutants would be created each year during preparation, packaging, and transport of tanks and TDMR: 0.36 tons CO, 0.14 PM ₁₀ , 0.05 VOCs, 0.25 NO _x , and 0.02 of SO _x . This represents less than 0.000001 percent of total Clark County emissions, well below <i>de minimus</i> levels for CO and PM ₁₀ nonattainment areas. | Emissions remain unchanged relative to baseline/no-action alternative levels. NTTR activities contribute less than 1 percent of total Clark County criteria pollutant emissions of CO, VOCs, PM ₁₀ , and SO ₂ and approximately 11 percent of NO _x . Periodic air monitoring would occur under this alternative. | Emissions remain unchanged relative to baseline/no-action alternative levels. NTTR activities contribute less than 1 percent of total Clark County criteria pollutant emissions of CO, VOCs, PM ₁₀ , and SO ₂ and approximately 11 percent of NO _x . |
| Soils and Water Resources | | |
| Preparation, packaging, transport, and disposal would not expand dispersal of DU contamination in the upper few inches of soil beyond current extent of 350 feet from Target 63-10 and in the immediate vicinity of the DU library; no evidence that DU contamination would enter surface or groundwater. No more than 1 acre of soil would be disturbed each year, to a depth of no more than a few inches, through preparation, loading, and transport. | Existing conditions of no downward settling in the soil or traces of DU in the small washes at the DU library, Target 63-10, and surrounding area to 350 feet would remain unchanged. No migration of DU to surface or ground water sources would continue; however, Nellis AFB would conduct periodic soil and water monitoring under this alternative. No additional soils would be disturbed since targets and TDMR would not be disposed. | Existing conditions of no downward settling in the soil or traces of DU in the small washes at the DU library, Target 63-10, and surrounding area to 350 feet would remain unchanged. No migration of DU to surface or ground water sources would occur. |

| Table 2-1 Comparison of Alternatives by Resource and Potential Environmental Consequences (con't) | | |
|---|--|--|
| <i>Proposed Action</i> | <i>On-Site Above Ground Monitoring Alternative</i> | <i>No-Action Alternative</i> |
| Hazardous and Radioactive Materials and Waste | | |
| No new waste streams would be created. Disposal of the DU-contaminated materials would take place at an approved LLW facility and transport of these materials would follow DOT designated routes and Nevada requirements to the LLW disposal facility. | Periodic collection and analysis of air and soil samples for radiological and heavy metal contamination to assess potential contamination migration over time via resuspension, wind dispersal, surface movement, and vertical migration in soils would be undertaken. No changes to existing penetrator storage and disposal procedures would occur. No DU-contaminated targets or TDMR would be disposed. DU-contaminated targets and TDMR would remain at the DU library. | Existing hazardous materials storage and handling procedures remain unchanged. DU penetrators are stored in munitions storage areas on Nellis AFB, loaded onto A-10 aircraft along the flightline, and fired at Target 63-10. Penetrators found on the ground surface at Target 63-10 are annually disposed and processed according to existing procedures and regulations for such materials. |
| Health and Safety | | |
| Existing handling procedures to ensure human health and safety would continue unchanged. The Air Force would follow regulated disposal procedures (e.g., breathing equipment and protective clothing) to ensure DU-contaminated targets and TDMR are packaged and transported correctly to minimize any potential effects to the environment. | Periodic collection and analysis of air and soil samples for radiological and heavy metal contamination to assess potential contamination migration over time via resuspension, wind dispersal, surface movement, and vertical migration in soils would be undertaken. No changes to existing penetrator handling and disposal procedures would occur. | Existing handling procedures to ensure human health and safety would continue unchanged. The Air Force would follow regulated handling and disposal procedures (e.g., breathing equipment and protective clothing) to ensure spent DU penetrators found on the surface are packaged and processed for disposal. |

| Table 2-1 Comparison of Alternatives by Resource and Potential Environmental Consequences (con't) | | |
|---|--|--|
| <i>Proposed Action</i> | <i>On-Site Above Ground Monitoring Alternative</i> | <i>No-Action Alternative</i> |
| Biological Resources | | |
| Vehicles used to load and transport targets and TDMR would negligibly effect localized vegetation; however, this vegetation is found within an active target area and has been routinely disturbed and no native habitats would be affected. Wildlife may be disturbed by equipment noise during disposal preparation; however, this noise would be infrequent and localized. The threatened desert tortoise have been recorded in the general area encompassing the DU-licensed area. While these tortoises are rare, the habitat conditions at the DU library and target array are poor. Therefore, DU-contaminated material disposal is unlikely to affect desert tortoise populations or their recovery. However, a monitor would be present during removal operations. | Since no preparation, loading, and transport would occur, it is unlikely that existing effects to vegetation and wildlife would change. The periodic monitoring of air, soil, and water would result in only minor effects from light-duty vehicular traffic to the DU library and Target 63-10—no significant increase or difference in operations found under existing conditions. | Existing conditions of light-duty vehicular traffic for NTTR maintenance and range operations would continue. No significant impact to vegetation, wildlife, and threatened and endangered species would result. |

Table 2-1 Comparison of Alternatives by Resource and Potential Environmental Consequences (con't)

| <i>Proposed Action</i> | <i>On-Site Above Ground Monitoring Alternative</i> | <i>No-Action Alternative</i> |
|--|--|--|
| Cultural Resources | | |
| No National Register-eligible archaeological, architectural, or traditional resources have been identified at the DU library and Target 63-10; the area is highly disturbed. Disposal of DU-contaminated materials should not affect cultural resources. SHPO concurs with finding of no effect. The Native American Program Document Review Committee, composed of five members who were selected by the Consolidated Group of Tribes and Organizations to represent 17 tribes with ancestral ties to NTTR, reviewed the EA. Their comments were incorporated into the final EA. The Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the report. | No National Register-eligible archaeological, architectural, or traditional resources have been identified at the DU library and Target 63-10; the area is highly disturbed. Periodic monitoring of air, soil, and water should not affect cultural resources. SHPO concurs with finding of no effect. The Native American Program Document Review Committee, composed of five members who were selected by the Consolidated Group of Tribes and Organizations to represent 17 tribes with ancestral ties to NTTR, reviewed the EA. Their comments were incorporated into the final EA. The Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the report. | The DU library and Target 63-10 are found in a highly disturbed area that has been found not to support archaeological, architectural, or traditional cultural resources. These conditions would remain unchanged. The Native American Program Document Review Committee, composed of five members who were selected by the Consolidated Group of Tribes and Organizations to represent 17 tribes with ancestral ties to NTTR, reviewed the EA. Their comments were incorporated into the final EA. The Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the report. |

CHAPTER 3

DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

CHAPTER 3

DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 ANALYSIS APPROACH

NEPA requires focused analysis of the areas and resources potentially affected by an action or alternative. It also indicates that an EA should consider, but not analyze in detail, those areas or resources not potentially affected by the proposal. Therefore, an EA should not be encyclopedic; rather, it should be succinct. NEPA also requires a comparative analysis that allows decision makers and the public to differentiate among the alternatives. This EA, therefore, focuses on those resources that could potentially be affected by methods to dispose of DU-contaminated targets and TDMR from the DU library.

CEQ regulations (40 CFR Parts 1500-1508) for NEPA also require an EA to discuss impacts in proportion to their significance and present only enough discussion of other than significant issues to show why more study is not warranted. The analysis in this EA considers the current conditions of the affected environment and compares those to conditions that might occur should any of the alternatives be implemented.

Affected Environment

Evaluation and analysis of the proposed action and alternatives indicate that exposure of the environment to DU-contaminated materials forms the driver for potential impacts. Therefore, the affected environment analyzed in this EA centers on Target 63-10 and the DU library, the authorized LLW transport routes, and approved LLW disposal facilities. All preparation, packaging, and loading of targets and TDMR would occur within the DU library, thus potentially affecting only the resources contained within that area. Once readied for transport, the affected environment consists of those routes already authorized and permitted by DOT to move LLW.

Resources Analyzed

Table 3-1 presents the results of the process of identifying resources considered in this EA. Based on evaluation of the affected environment and information derived through scoping, this assessment evaluates air quality; soils and water resources; health and safety (includes LLW transportation); hazardous materials and waste; biological resources; and cultural resources. These resources have shown to be potentially affected by implementation of the proposed action and alternatives.

| Table 3-1 Resources Analyzed in the Environmental Impact Analysis Process | | |
|--|---|----------------------------|
| <i>Resources</i> | <i>Potentially Affected by DU-Contaminated Target and TDMR Disposal</i> | <i>Analyzed in this EA</i> |
| Air Quality | Yes | Yes |
| Soils and Water Resources | Yes | Yes |
| Hazardous Materials and Waste | Yes | Yes |
| Health and Safety (includes LLW Transportation) | Yes | Yes |
| Biological Resources | Yes | Yes |
| Cultural Resources | Yes | Yes |
| Socioeconomics/Environmental Justice | No | No |
| Airspace Management | No | No |
| Noise | No | No |
| Land Management and Use, Recreation, and Visual Resources | No | No |

Both the resources analyzed and those excluded have been addressed in previous documents, including the *Depleted Uranium Management Plan* (Air Force 2000), *Nevada Test and Training Range Target 63-10* (Air Force 2000), *Environmental Assessment for Resumption of Use of Depleted Uranium Rounds at Nellis AFR* (Air Force 1998b), *Integrated Natural Resources Management Plan Nellis AFB, Nellis AFR* (NAFB 1999), *Inventory for Rare, Threatened, Endangered, and Endemic Plants and Unique Communities on Nellis Air Force Bombing and Gunnery Range, Clark, Lincoln, and Nye Counties, Nevada* (The Nature Conservancy 1997), *Renewal of the Nellis Air Force Range Land Withdrawal Legislative Environmental Impact Statement* (Air Force 1999), *Memorandum of Understanding DE-GM08-98NV13457, Department of Energy and Nellis AFB* (Air Force 1998a), can be incorporated by reference.

Resources Eliminated from Further Analysis

The Air Force assessed numerous resources (refer to Table 3-1) that, in accordance with CEQ regulations, warranted no further examination in the EA. The following describes the rationale for this approach.

Socioeconomics/Environmental Justice. Socioeconomics focuses on the general features of the local economy that could be affected by the proposed action or alternatives. Because no new jobs would be created or eliminated by implementation of the proposed action or alternatives, nor would the affected areas experience any economic growth or loss through implementation of the proposed action and alternatives, this resource has been eliminated from further discussion. Annual costs for preparation, transport, and disposal would remain negligible (i.e., approximately \$250,000 per year) in comparison to the billions of dollars generated in the Las Vegas region.

Environmental justice addresses disproportionate effects of a federal action on low-income or minority populations. The existence of disproportionately high and adverse impacts depends on the nature and magnitude of the effects identified for each of the individual resources. Of the affected areas, both the

DU licensed area and the classified and unclassified LLW disposal facilities comprise closed, secure sites situated well-away from communities of any kind. As such, no potential to affect people of any ethnicity or income level would exist. While transport of the contaminated targets and TDMR would use public roads or rail, the routes and transport procedures have been evaluated (DOE 1999) and determined not to pose a risk to communities or population centers nor disproportionately impact low income or minority populations. Since neither minority nor low-income groups would be affected disproportionately by implementation of the proposed action or alternatives, environmental justice was eliminated from further analysis.

Airspace Management. Airspace management would not be affected by the proposed action or alternatives. No part of the action employs or influences airspace operations or air traffic management; all action elements would occur on the ground, so they would not impact either the management or use of airspace. For this reason, airspace management was eliminated from further analysis.

Noise. Noise is often defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying. Response to noise varies by the type and characteristics of the noise source, distance from the source, receptor sensitivity, and time of day. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by stationary or mobile sources. Noise generated from activities associated with the proposed action and alternatives would not change the local noise environment. Noise from preparing and loading targets and TDMR once a year would result from trucks and heavy equipment. This temporary noise would remain confined to the DU library, an area already affected by louder, more consistent noise from aircraft operations overhead. During transport, truck or railroad noise would be consistent with the noise along the existing highway or rail line; no new noise sources would be introduced to new areas. Again, the disposal sites represent industrial facilities where noise of this type commonly occurs. Therefore, this resource has been eliminated from further analysis.

Land Management and Use, Recreation, and Visual Resources. Land management and use of Target 63-10 and the DU library would not change from existing use as a holding area for DU-contaminated targets and TDMR. The proposed action or alternatives would not affect recreation resources since the DU-licensed area falls within land withdrawn for military purposes, which support military activities, and prohibit recreational use of this land. Similarly, the activities under the proposed action or alternatives would not affect visual resources because military use of the land would remain consistent. Transport and disposal would occur along existing routes and at existing facilities; no effects on land use, recreation, or visual resources would ensue. Effects to these resources under the proposed action or alternatives would not change the existing conditions; therefore, they are not analyzed in this EA.

3.2 AIR QUALITY

Understanding air quality for the affected area requires knowledge of: 1) applicable regulatory requirements; 2) types and sources of air quality pollutants; 3) location and context of the affected area; and 4) existing setting.

Regulatory Requirements. Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. The Clean Air Act (CAA) and its subsequent amendments (CAAA) established the National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns (PM₁₀), and lead (Pb). These federal NAAQS standards (Table 3-2) represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

Based on measured ambient criteria pollutant data, the U.S. Environmental Protection Agency (USEPA) designates all areas of the U.S. as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. An area that is currently in attainment, but was formerly a nonattainment area is termed a maintenance area. An area is often designated as unclassified when there are insufficient ambient criteria pollutant data for the USEPA to form a basis for attainment status. Unclassified areas are typically rural or remote, with few sources of air pollution.

The CAA requires each state to develop a State Implementation Plan (SIP) which forms its primary mechanism for ensuring that the NAAQS are achieved and/or maintained within that state. According to plans outlined in the SIP, designated state and local agencies implement regulations to control sources of criteria pollutants. The CAA provides that federal actions in nonattainment (e.g., Clark County) and maintenance areas do not hinder future attainment with the NAAQS and conform with the applicable SIP. No specific requirements apply to federal actions in unclassified or attainment areas. The Clark County Board of Commissioners is responsible for preparing the SIPs for nonattainment areas within Clark County that include CO and PM₁₀. All other criteria pollutant SIPs fall under the jurisdiction of the Nevada Division of Environmental Protection (NDEP), Bureau of Air Pollution Control (BAPC). Both Clark County and NDEP have adopted the NAAQS with some additions; see Table 3-2 for these standards.

The CAA also establishes a national goal of preventing degradation or impairment in any federally-designated Class I area. As part of the Prevention of Significant Deterioration (PSD) program, mandatory Class I status was assigned by Congress to all national parks, national wilderness areas, memorial parks greater than 5,000 acres, and national parks greater than 6,000 acres. In Class I areas,

visibility impairment is defined as a reduction in visual range and atmospheric discoloration. Stationary sources, such as industrial complexes, are typically an issue for visibility within a Class I PSD area.

Table 3-2 Clark County, Nevada, and National Ambient Air Quality Standards

| | AVERAGING TIME | <i>Clark County Standards</i> | <i>Nevada Standards^A</i> | <i>NAAQS^B</i> | |
|--|---------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|
| | | CONCENTRATION CENTER | CONCENTRATION CENTER | PRIMARY CENTER ^{C,D} | SECONDARY CENTER ^{C,E} |
| Ozone (O ₃) | 8 Hours ^F | 157 µg/m ³ (0.08 ppm) | 157 µg/ m ³ (0.08 ppm) | 157 µg/ m ³ (0.08 ppm) | Same as Primary |
| Ozone-Lake Tahoe Basin, #90 | 1 Hour | 235 µg/ m ³ (0.12 ppm) | 235 µg/ m ³ (0.12 ppm) | 235 µg/ m ³ (0.12 ppm) | Same as Primary |
| | | -- | 190 µg/ m ³ (0.10 ppm) | -- | -- |
| Carbon Monoxide (CO) less than 5,000 ft above MSL | 8 Hours | 10 mg/m ³ (9.0 ppm) | 10 mg/m ³ (9.0 ppm) | 10 mg/ m ³ (9.0 ppm) | None |
| Carbon Monoxide at or greater 5,000 ft above MSL | | -- | 6.67 mg/ m ³ (6.0 ppm) | | |
| Carbon Monoxide at any elevation | 1 Hour | 40 mg/ m ³ (35 ppm) | 40 mg/ m ³ (35 ppm) | 40 mg/ m ³ (35 ppm) | |
| Nitrogen Dioxide (NO ₂) | Annual Arithmetic Mean | 100 µg/ m ³ (0.05 ppm) | 100 µg/ m ³ (0.05 ppm) | 100 µg/ m ³ (0.05 ppm) | Same as Primary |
| Sulfur Dioxide (SO ₂) | Annual Arithmetic Mean | 80 µg/ m ³ (0.03 ppm) | 80 µg/ m ³ (0.03 ppm) | 80 µg/ m ³ (0.03 ppm) | None |
| | 24 Hours | 365 µg/ m ³ (0.14 ppm) | 365 µg/ m ³ (0.14 ppm) | 365 µg/ m ³ (0.14 ppm) | |
| | 3 Hours | 1,300 µg/ m ³ (0.5 ppm) | 1,300 µg/ m ³ (0.5 ppm) | None | 1,300 µg/ m ³ (0.5 ppm) |
| Particulate Matter PM ₁₀ | Annual Arithmetic Mean | 50 µg/ m ³ | 50 µg/ m ³ | 50 µg/ m ³ | Same as Primary |
| | 24 Hours | 150 µg/ m ³ | 150 µg/ m ³ | 150 µg/ m ³ | |
| Particulate Matter PM _{2.5} ^G | Annual Arithmetic Mean | 15 µg/ m ³ | 15 µg/ m ³ | 15 µg/ m ³ | Same as Primary |
| | 24 Hours | 65 µg/ m ³ | -- | 65 µg/ m ³ | |
| Lead (Pb) | Quarterly Arithmetic Mean | 1.5 µg/ m ³ | 1.5 µg/ m ³ | 1.5 µg/ m ³ | Same as Primary |
| Hydrogen Sulfide (H ₂ S) | 1 Hour | -- | 112 µg/ m ³ (0.08 ppm) | -- | -- |

Notes µg/m = micrograms per cubic meter of air; ppm = part per million by volume.

A: These standards must not be exceeded in areas where the general public has access.

B: These standards, other than for ozone and those based on annual averages, must not be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.

C: Concentration is expressed first in units in which it was adopted and is based upon a reference temperature of 25° C and a reference pressure of 760 mm of mercury. All measurements of air quality must be corrected to a reference temperature of 25° C and a reference pressure of 760 mm of Hg (1,013.2 millibars); ppm in this table refers to ppm by volume, or micromoles of regulated air pollutant per mole of gas.

D: National primary standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

E: National secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a regulated air pollutant.

F: USEPA promulgated federal 8-hour ozone standards in April 2004.

G: PM_{2.5} standards were promulgated in July 1997 but have not been regulated.

Source: CCAQM 2004 and NDEP 2004.

Types and Sources of Air Quality Pollutants. Pollutants considered in the analysis for this EA comprise the criteria pollutants measured by state and federal standards. These include SO₂ and other compounds (i.e., oxides of sulfur or SO_x), volatile organic compounds (VOCs), which are precursors to (indicators of) O₃; nitrogen oxides (NO_x), which are also precursors to O₃ and include NO₂ and other compounds; CO and PM₁₀. The types of activities associated with the proposed action and alternatives (e.g., loading, packaging, and transport) generate emissions primarily from truck, rail, and heavy equipment use. The analyses excludes airborne emissions of lead and hydrogen sulfide because there is no known significant hydrogen sulfide or lead emissions sources in the region or associated with the proposed action and alternatives.

3.2.1 Affected Environment

Location and Context of Affected Areas. The most focused aspects of the proposed action and alternatives occur within a single general area centered on the DU library and Target 63-10 within the South Range of NTTR. This portion of NTTR (refer to Figure 1-1) lies approximately 50 miles northwest of Las Vegas and 12 miles northeast of Indian Springs. The affected area within NTTR consists of unpopulated lands lacking notable sources of emissions situated north of Las Vegas Valley Hydrographic Basin 211 within Clark County (CCAQM 2004). This basin officially defines the boundaries of the Las Vegas Valley. The Valley is situated on the edge of the Mojave Desert, experiences a typical arid climate, and covers approximately 500 square miles. While not encompassing the affected area of the proposed action and alternatives, this valley (found in Clark County) is in CO and PM₁₀ nonattainment, particularly in the city of Las Vegas (CCAQM 2004). Indian Springs is in attainment for CO and PM₁₀ (CCAQM 2004).

Existing Air Quality Setting. With the exception of its very southern tip nearest Las Vegas (Range 63A), the NTTR is unclassified for state and federal air quality standards. The DU library and Target 63-10 lie within this unclassified area. For this reason, neither the USEPA nor the Clark County and Nevada SIPs identify any air quality issues for the area encompassing the DU library and 63-10 target array. However, criteria pollutant emissions are examined under this proposed action and alternatives due to the adjacency of the affected environment to the nonattainment areas.

Baseline Emissions for NTTR. NTTR covers approximately 2.9 million acres and is composed of dozens of ranges, hundreds of target areas and complexes, and numerous facilities. The DU library and Target 63-10 are found in Range 63 located in the southern extreme of the NTTR South Range. Stationary source emissions at NTTR originate primarily from on-range facilities equipment and ground maintenance found at Indian Springs Air Force Auxiliary Field (AFAF), Point Bravo Range Complex, Silver Flag Alpha Complex, Tonopah Test Range, Tonopah Electronic Combat Range, and Tolicha Peak Electronic Combat Range. Mobile source emissions include aircraft operations and vehicular traffic.

Total emissions at the NTTR are presented in Table 3-3. NTTR contributes less than 1 percent to the total CO, VOCs, PM₁₀, and SO₂ emissions and approximately 11 percent of NO_x emissions in Clark County.

| Table 3-3 Baseline Ground-Based and Aircraft Operation Emissions (tons/year) | | | | | |
|---|-----------|-------------|-----------------------|-----------------------|------------------------|
| | <i>CO</i> | <i>VOCs</i> | <i>NO_x</i> | <i>SO_x</i> | <i>PM₁₀</i> |
| Ground-Based at NTTR ¹ | 2.30 | 4.31 | 10.57 | 3.83 | 0.75 |
| Ground-Based at Indian Springs AFAF ² | 4.26 | 2.81 | 19.73 | 2.21 | 14.65 |
| Aircraft ³ | 695.0 | 52.0 | 8,983.0 | 214.0 | 230.0 |
| Total NTTR Emissions | 701.56 | 59.12 | 9,013.30 | 220.04 | 245.40 |
| Clark County ⁴ Emissions | 488,703 | 64,910 | 83,435 | 47,622 | 69,962 |

¹ Includes ground-based facility emissions from all non-exempt sources associated with the three operating facilities at the Tonopah Test Range (within the NTTR): i.e., Area 10, Cedar Pass, the Operations and Maintenance Compound (Tonopah Electronic Combat Range), and the Tolicha Peak Electronic Combat Range, as reported in the 2003 Nevada Test and Training Range Air Emissions Inventory (AEI) Report (NAFB 2003a). The AEI report includes fuel combustion emissions from generators and equipment operating at these facilities.

² Includes ground-based facility emissions from all non-exempt sources associated with the three operating facilities at the Indian Springs AFAF, Point Bravo Range Complex, and Silver Flag Alpha Complex, as reported in the 2003 Indian Springs Auxiliary Field Air Emissions Inventory Report (NAFB 2003b). The report includes fuel combustion emissions from generators and equipment operating at these facilities.

³ Renewal of the Nellis Air Range Land Withdrawal (Air Force 1999) Environmental Impact Statement.

⁴ EPA AirData Tier Emissions Report (USEPA 1999).

No PSD Class I areas lie within 50 miles of the DU library and Target 63-10. Zion National Park, in Utah and Grand Canyon National Park in Arizona are over 200 miles east of the proposed action and alternatives. The combination of low total emissions from NTTR operations and the distance to the PSD Class I area, indicates that visibility is not impaired, especially since most emission sources (aircraft) are mobile and transitory.

3.2.2 Environmental Consequences

Proposed Action

The air quality analysis for the proposed action quantifies the changes (increases and decreases) due to the DU disposal activities. The CAA prohibits federal agencies from supporting activities that do not conform to a SIP that has been approved by the USEPA. To assess the effects of the proposed action, analysis must include direct and indirect emissions from all activities that would affect the regional air quality. Emissions from proposed actions are either “presumed to conform” (based on emissions levels that are considered insignificant in the context of overall regional emissions) or must demonstrate conformity with approved SIP provisions.

Emissions from the proposed action include the packaging, loading, and transport of DU tanks and TDMR. Emissions associated with the proposed action include fugitive dust (PM₁₀) from moving DU-contaminated targets and combustion (primarily CO and NO_x, and smaller amounts of VOCs, SO_x, and PM₁₀) from heavy-duty diesel removal equipment exhaust (e.g., truck, crane, and forklift). These emissions estimates were based on conservative assumptions that one heavy-duty truck, a forklift, and a crane operates for 25 days per year. Two government owned light-duty trucks would travel to and from the Target 63-10 and the DU library 25 days per year, four trips per day, at 30 miles per roundtrip

(Appendix C provides air quality calculations). These estimates also assumed that loading activities and transport would disturb approximately 1 acre of soil per year to produce fugitive dust. Exhaust emissions from heavy-duty diesel equipment were based on a mix of typical material removal equipment. Table 3-4 summarizes emissions during the packaging, loading, and transport of DU-contaminated materials for disposal.

| Table 3-4 Projected Pollutant Emissions | | | | | |
|--|--------------------------------------|--------------------|------------------------------|------------------------------|-------------------------------|
| | <i>Pollutants (Tons/Year)</i> | | | | |
| | <i>CO</i> | <i>VOCs</i> | <i>NO_x</i> | <i>SO₂</i> | <i>PM₁₀</i> |
| Preparation/Loading | 0.03 | 0.13 | 0.20 | 0.01 | 0.07 |
| Transport/Travel | 0.02 | 0.23 | 0.05 | 0.01 | 0.07 |
| Total | 0.05 | 0.36 | 0.25 | 0.02 | 0.14 |

Source: USAF Air Conformity Applicability Model (ACAM) 4.0.2, Mobile 6 (Air Force 2004a)

Decontamination and declassification activities requiring the use of mechanical removal methods would use a HEPA filter vacuum to capture metals and other particulates for disposal. The limited amount of increased vehicle trips and ground disturbance activities (i.e., movement of tank targets and TDMR) would generate only minor amounts of fugitive dust (PM₁₀). Overall, the small amounts (less than a half ton for all criteria pollutants) of emissions would be well below the *de minimus* levels for the Las Vegas Valley for both CO (100 tons *de minimus*) and PM₁₀ (70 tons *de minimus*). In addition, these emissions would be short-term and distributed within a large volume of air. Transport emissions would disperse along extensive linear corridors (e.g., highways, rail lines) located throughout Nevada and elsewhere in the United States. Given this context and the temporary, transient nature of any emissions from the transport activities, the pollutant contribution of the proposed action would not affect local or regional air quality to any measurable extent and would conform with Clark County and Nevada SIP provisions.

On-Site Above Ground Monitoring Alternative

This alternative would essentially implement the no-action alternative with the addition of monitoring (i.e., air, soil, and water) at the site. No increase in truck or heavy equipment use or decontamination activities would occur under this alternative. The only source of additional emissions would consist of brief, infrequent, and localized fugitive dust and vehicle emissions resulting from monitoring activities. Such emissions would not noticeably exceed those generated under baseline conditions. The Air Force would need to schedule air monitoring events.

No-Action Alternative

Under the no-action alternative, disposal of targets and TDMR from the DU library would not occur. The Air Force would not employ methods to decontaminate/declassify and reuse targets elsewhere on NTTR or transport and dispose of TDMR at this time. Baseline emissions for NTTR would remain unchanged through implementation of this alternative.

3.3 SOILS AND WATER RESOURCES

Soils consist of unconsolidated materials subject to erosion and loss from wind, water, and mechanical forces. Water resources include surface water and groundwater. The analysis in this EA addresses potential adverse effects to soil and water resources in the immediate vicinity of the DU library from activities associated with DU-contaminated targets and TMDR disposal. The EA excludes analysis of transport along existing road and rail routes as soils or water resources would not be affected since the Air Force would seal or containerize the targets and TMDR, retaining them on the carrier until removal at a disposal site and preventing exposure to the environment. While the possibility exists that an accident could place contaminated targets or TMDR in contact with soils or water sources along the transport route, procedures governing transport safety minimize that possibility. Furthermore, mere contact from an accident would not contaminate soils or water, and, as noted in Section 3.4, cleanup would be conducted in accordance with applicable federal regulations. At the disposal sites, operators ensure that the facilities containing LLW would be prepared and sealed.

3.3.1 Affected Environment

Soils. The DU-license area, located in the southern part of Three Lakes Valley, covers approximately 4 square miles. Soils consist mostly of sand and small rock, with alluvial terrain transected by natural arroyos running throughout. Some of the arroyos reach up to 1 meter in depth. Small, shallow, and irregular arroyos run through and near the DU library, but lose definition and flatten out a few hundred feet down the shallow slope. Soils on NTTR have not been mapped, however, general descriptions of soils series are available from the U.S. Department of Agriculture (USDA).

Soils at NTTR consist of the following: St. Thomas series, consisting of shallow, well-drained soils that formed in colluvium and residuum from limestone and dolomite are the primary soil types found in the mountains (NBMG 1997). These soils generally occur on hills and mountains with 8 to 75 percent slopes. The Crosgrain and Arizo soils series are the primary soil types of the fan piedmonts. The Crosgrain series are shallow, well-drained soils that formed in mixed alluvium on ballenas (old fan piedmonts) with slopes 4 to 30 percent. The Arizo series are very deep, excessively drained soils that formed in mixed alluvium on recent alluvial fans, with slopes of 0 to 15 percent. The basin floors generally consist of Mazuma series soils. The Mazuma series are very deep, well drained soils that formed in alluvium and lacustrine materials from mixed rock sources. Mazuma soils occur on fan skirts and alluvial flats, with slopes of 0 to 15 percent. The DU library and Target 63-10 both occupy a shallow alluvial slope. The alluvial soils that dominate the fan basins are subject to wind erosion, with fine-grained materials are often entrained into the airstream and can result in fugitive dust (Air Force 1999). Slight slopes in the area, combined with rare but sometimes powerful localized thunderstorms, can result in soil erosion. However, down-gradient from the DU library and target area lies a large closed playa that retains erosional material.

A 1994 Air Force study (Air Force 1994) examined the potential extent and migration of DU-contaminated soil particles at Target 63-10 and within the target strafe fan. The study revealed that contamination centered in the immediate Target 63-10 area. Patterns derived from the study indicate that DU and its oxides settled rapidly and close to the target area. Immediately beyond this area, and further, the soil contained low and ever-decreasing quantities consistent with background levels of radiation. By a distance of 350 feet from the target array, no evidence of DU contamination was found. Similarly, sampling revealed no downward settling of DU in the soil profile and the small washes contain no traces. These results demonstrate that neither wind nor soil erosion results in lateral or downward migration of DU at or beyond the target strike zone.

Water. The scarcity of surface water resources on NTTR is attributed to a dry regional climate characterized by low precipitation, high evaporation, low humidity, and wide extremes in daily temperatures. Average precipitation depends mainly on elevation and ranges from 4 inches on the valley floor to about 20 inches in the mountain areas. The affected environment lies within an arid setting where the annual rainfall seldom exceeds 8 inches (Air Force 1998c). With the exception of locally intense thunderstorms that can produce flash flooding, much of the warm weather precipitation is lost to the atmosphere through evaporation and transpiration.

Within the NTTR, the availability of moisture in excess of evaporation and transpiration is so limited that few perennial surface water features are present (Air Force 1997). With the exception of man-made ponds and catchments, the only perennial surface water comes from springs that form where ground water intersects the surface. The springs flow for short distances on the ground surface, which is underlain by bedrock. Most surface water is temporarily present as a result of ponding in low permeability playas and as ephemeral channel flow from infrequent precipitation and snowmelt runoff. Playas are not major recharge zones due to the low infiltration potential. Most surface water that reaches the playas is lost through evaporation. The DU-license area and DU library contain no springs, man-made ponds, or perennial water courses; a few small, ephemeral arroyos transect the area (Air Force 1997).

Criteria for water quality within the State of Nevada are contained in the NAC, Chapter 445A.119, and apply to existing and designated beneficial uses of surface water bodies. Water quality standards are driven by the beneficial uses of specific water bodies. Beneficial uses include agriculture (irrigation and livestock watering), aquatic life, recreation (contact and non-contact), municipal or domestic supply, industrial supply, and wildlife propagation. There is a three-tiered system of beneficial use designation of surface water resources within the NAC depending upon the size of the water body.

1. Major water bodies or rivers are specifically designated by name (in some cases by reach) and are assigned numeric standards (NAC Sections 445A.145 to 445A.225) or thresholds as well as anti-degradation criteria.

2. Smaller water bodies are classified (i.e., Class A, B, C, and D) as to the condition of the waters “as affected by discharges relating to the activities of man.” Water quality standards are specified for each of the water classifications (NAC Sections 445A.124 to 445A.127).
3. Other surface waters are protected by generic standards that apply to all waters of the state (NAC Section 445A.121).

Due to the rare and transient occurrence of surface water within the affected area of the DU library and Target 63-10, there are no bodies of surface water present that are designated for specific beneficial uses (i.e., categories 1 or 2 above). All surface water (e.g., ephemeral streams) within NTTR, including the small arroyos noted in affected areas, are regulated under the standards applicable to all waters of the state (i.e., category 3). Since none of the existing activities at the DU library or Target 63-10 involve discharges to these ephemeral arroyos, no additional classification applies.

The State of Nevada has adopted drinking water standards established by the USEPA, under the Safe Drinking Water Act. The Nevada Department of Health regulates drinking water quality for public supply systems. Drinking water standards consist of maximum contaminant levels (MCLs) established for various water quality constituents. Primary MCLs are established to protect against adverse health effects and are enforced for public drinking water supplies. Secondary MCLs are established for aesthetic reasons such as taste, color, or odor and are not enforceable on public drinking water supplies. Thresholds are established for selected constituents that, if exceeded by a specified percentage of samples (based on the number of people served), require treatment of the water source prior to distribution to users of the supply system. Testing of wells down-gradient from the DU-license area showed no contamination from DU (Air Force 2000).

Nevada’s groundwater typically occurs in unconsolidated deposits of sand, gravel, silt, and clay that partly fill the many basins. Principal groundwater sources derive from the alluvial-fill aquifer underlying the Las Vegas Valley. Wells located in the northwest part of the valley serve the Las Vegas Valley Water District and while those in the northern end of the valley serve North Las Vegas. None of these wells lie closer than 10 miles from Target 63-10. Wells 62-1 and 106-2 provide water to the Indian Springs AFAF (Air Force 1994, 1998c). Wells 2278-1 and 2362-1 provide water to Point Bravo and Silver Flag Alpha, respectively (Air Force 1998c). A 1994 site assessment and drinking water samples for these wells demonstrate no migration of DU into groundwater or wells (Air Force 1994). Both shallow and deep groundwater yielded no traces of DU, with radiation at normal background levels (NEL various dates). Furthermore, the amount of groundwater recharge in NTTR area depends upon precipitation, evapotranspiration, permeability of the surface soils, and vegetation. The greatest opportunity for groundwater recharge tends to apply in areas of permeable surface materials during periods when precipitation is in excess of evapotranspiration. However, because evaporation normally exceeds precipitation rates from -51 to -65 inches annually on NTTR (Eakin *et al.* 1976), negligible recharge

occurs on valley floors. As noted above, drinking water sampling on and near Target 63-10 revealed no infiltration of DU.

3.3.2 Environmental Consequences

Proposed Action

Impacts to soil resources under the proposed action would be temporary and insignificant. Minor disturbance (less than 1 acre) to soils would result from movement of heavy equipment and trucks during preparation and loading of targets and TDMR, as well as during target replacement (on average, every 5 to 7 years). The low frequency, brief duration (approximately 25 days), and limited geographic scope of loading and moving targets and TDMR would negligibly affect already disturbed soils at Target 63-10 and DU library. Disturbance would likely be limited to areas transected by tracked or wheeled vehicles. The area of disturbance would remain similar each year target disposal activities occur.

None of the proposed preparation, loading, or removal efforts would cause the migration of DU or its oxides into soils. These efforts would not change conditions from those found in the previous studies noted above; DU contamination would remain localized.

For similar reasons, surface and groundwater resources would not be impacted through implementation of the proposed action. The area for miles surrounding the South Range lacks springs or surface water sources. Loading and other activities would not cause dispersal of DU into water courses. Methods used to decontaminate and/or declassify targets would be confined to the DU library.

On-Site Above Ground Monitoring Alternative

Monitoring of soil and water resources (in addition to air monitoring) at the DU library and target array would occur under implementation of this alternative. However, baseline conditions would remain unchanged. Based on past study results, the long-term presence of the targets and TDMR would not change the dispersal or accumulation of DU.

No-Action Alternative

Soil and water resources at the NTTR Target 63-10 and the DU library would remain unchanged relative to baseline conditions under the no-action alternative. The Air Force would not employ methods to decontaminate/declassify and reuse targets elsewhere on NTTR or transport and dispose of TDMR at this time.

3.4 HAZARDOUS AND RADIOACTIVE MATERIALS AND WASTE

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation and Liability Act; the Occupational Safety and Health Act (OSHA); and the Emergency

Planning and Community Right-to-Know-Act. The RCRA defines hazardous waste as any solid, liquid, contained gaseous or semisolid waste, or any combination of waste that could pose a substantial hazard to human health or the environment. Hazardous materials have been identified in AFI 32-7086 *Hazardous Materials Management*, to include any substance with special characteristics that could harm people, plants, or animals when released. Waste may be classified as hazardous because of its toxicity, reactivity, ignitability, or corrosiveness. In addition, certain types of waste are listed or identified as hazardous in 40 CFR 261.

3.4.1 Affected Environment

Hazardous materials associated with the DU library and Target 63-10 include heavy metals constituting principally DU and DU oxides, and Radium-226. Radium-226 is present in some of the targets as a component of installed dials and gauges. The Radium-226 radioactive constituent can be detected by a combination of visual observation, process knowledge of the potential locations and types of these materials, and by measurement via hand-held beta/gamma detection instruments. Radium-226 adheres quickly to solids and does not migrate far from its place of release. Radium-226 decays by alpha particle radiation, making ingestion and inhalation the primary pathways of concern. Radium is chemically similar to calcium and when ingested, a small fraction is transferred across the small intestine and most is deposited in bone, which contains 70 to 95 percent of the total ingested body radium. Radium-226 decays by alpha particle radiation to the inert gas radon-222. This gas also decays by alpha particle radiation. Due to the short half-life of radon-222, which is 3.8 days, there is a high probability it will decay in the body when breathed in, emitting alpha particle radiation in the body. Radium-226 and its decay products are responsible for a major fraction of the dose received by humans from naturally occurring radionuclides (Air Force 1998a).

Other materials at the DU library may include residual petroleum, oils, and lubricants within out-of-service target vehicles; batteries and fluids; and lead and chromium. While existing NTTR procedures require removal and appropriate disposal of such materials prior to acceptance of a target at the DU library, old targets may contain some of these materials (personal communication, Schofield 2003). The Air Force estimates that the quantities of such materials are minimal and pose no immediate environmental concern. When encountered, the Air Force removes and processes these materials in accordance with existing, approved procedures for NTTR.

Activities at the DU library and Target 63-10 do not generate hazardous wastes. Furthermore, there are no active environmental restoration program sites located on or adjacent to the affected areas (Air Force 1999).

The DU library contains DU and other materials within the targets themselves, and localized contamination is present on the ground surface and in the near subsurface horizon in the form of

particulate matter and debris. Various studies (Air Force 1994, UNEP 2001) have evaluated the extent of contaminant migration, both vertically and laterally, through air, soil, and water pathways. These studies demonstrated the persistence of DU contamination to resist movement over time and established a baseline dataset of contamination concentration and location. At Target 63-10 and DU library, the established baseline is in the immediate area of the DU library and target array. DU contamination has not extended more than 350 feet from the target array (Air Force 1994).

The AFIOH conducted radiological assessments on four DU-contaminated unclassified tanks in the DU library selected for disposal at the US Ecology Hazardous Waste Treatment and Disposal Facility in Idaho (Air Force 2004b). US Ecology is a Subtitle C, RCRA hazardous waste disposal facility licensed by the State of Idaho. The assessments calculated the potential radiation dose to drivers transporting the tanks to the US Ecology site and the workers placing the tanks in the burial site using RESRAD version 6.1. They reached the conclusion that, based on total DU material relative to tank volume (less than 0.05 percent by weight of uranium), the amount of uranium in each tank comprised an unimportant quantity according to RCRA standards.

3.4.2 Environmental Consequences

The magnitude of potential impacts associated with hazardous materials and wastes depends on the toxicity, transportation, storage, and disposal of these substances. Hazardous materials and hazardous waste impacts are considered adverse if the storage, use, transportation, or disposal of these substances substantially increases the human health risk or environmental exposure. An increase in the quantity or toxicity of hazardous materials and/or hazardous waste handled by a facility may also signify a potentially adverse effect, especially if a facility was not equipped to handle the new waste streams.

Proposed Action

Implementation of the proposed action would result in minimal effects. None of the activities would generate new waste streams or introduce new materials. Rather, the process would remove and dispose of hazardous materials and waste.

The DU library represents a fairly static secure site, because most of the targets and associated TDMR have been held and not moved for an extended period of time. The proposed action, however, would alter that static condition as a result of collecting and packaging targets and TDMR. Additionally, targets identified as acceptable for decontamination would undergo a variety of activities to eliminate the radioactive hazard, including physical removal of penetrator/plugs from targets, agitation of radioactive contaminated surfaces with wire brushes and similar tools, HEPA vacuuming, cutting away of contaminated material using an oxygen/acetylene torch, and grinding of contaminated surfaces.

Prior to packaging and loading of targets and TDMR, the Air Force would ensure removal of materials such as petroleum, oils, lubricants, batteries, and fluids. These materials and wastes would be handled using existing, approved procedures for NTTR. The Air Force would require a Health and Safety Plan for each disposal effort.

Generally, DU is considered as waste classification A for purposes of disposal. Because the TDMR and target packaging requires complete sealing or enclosure in sealed shipping containers, the potential for wastes to disperse would be negligible. DOT regulates packaging of radioactive materials under 49 CFR Chapter I, Subchapter C, Subpart D, *Marking*, and Subpart K, *Specifications for Packagings for Class 7 (Radioactive) Materials*. The Air Force would meet the material packaging requirements, including regulations for surface contaminated objects. If other regulated wastes were present, however, they would be handled differently to account for mixed waste. Such a scenario would only apply to the potential for other toxic constituents combined with DU surface contamination. As established in Section 2.2, the potential for mixed waste among the targets and TDMR would be negligible. Given the required removal procedures and negligible potential for other wastes, no impacts involving mixed wastes are anticipated.

As established by a recent assessment (Air Force 2004b), the quantity by volume of uranium would be unimportant by RCRA standards. Disposal therefore, would not pose a RCRA issue.

Disposal of LLW that may be identified during the collection process would occur through coordination with the AFRMWO in accordance with 10 CFR Parts 20 and 61, and AFI 40-201 *Managing Radioactive Materials in the USAF (U.S. Air Force)*.

Before transportation of the LLW for ultimate disposal at a licensed facility, the Air Force would ensure preparation of a manifest including the information requested on NRC Forms:

- 540 (and 540A), *Uniform Low-Level Radioactive Waste Manifest - Shipping Paper (and Continuation)*;
- 541 (and 541A), *Low Level Waste Manifest Container and Waste Description (and Continuation)*; and
- 542 (and 542A), *Low Level Waste Manifest Index and Regional Compact Tabulation (and Continuation)*, as applicable.

NRC Forms 540 and 540A would be completed and must accompany each shipment. Upon agreement between Nellis AFB and the receiving facility, NRC Forms 541, 541A, 542, and 542A would be completed, transmitted, and stored in electronic media with the capability of producing legible, accurate, and complete records of the forms in the format of a uniform manifest. Additional documentation requirements, including significant pre-shipping documentation requirements necessary to meet the various disposal facility waste acceptance criteria (WAC) guidelines, would be prepared.

On-Site Above Ground Monitoring Alternative

The on-site above ground monitoring alternative would incorporate the periodic collection and analysis of air, water, and soil samples for radiological and heavy metal contamination to assess potential contamination migration over time via resuspension and wind dispersal and surface movement or vertical migration in the soils. This alternative would not change the status quo, and therefore, would not pose any adverse effects if it were implemented.

No-Action Alternative

The no-action alternative would continue existing conditions. DU-contaminated targets and TDMR would remain on site at the DU library for the foreseeable future.

3.5 HEALTH AND SAFETY

Health and safety, for this EA, addresses potential exposures of range personnel, packaging and disposal contractors, and the general public to DU and associated materials. Potential sources of exposure warranting analysis include DU library management, handling during decontamination and packaging, and transport.

Primary health and safety issues center on low-level radiation and heavy metals exposure, and possible exposure to organics from specific activities such as cutting and grinding. These exposures are chiefly associated with inhalation hazards and to a lesser extent, ingestion. Materials of concern include DU and DU oxides; and Radium-226 (ATSDR 1999).

3.5.1 Affected Environment

DU contamination (DU and DU oxides) is present at the DU library and Target 63-10 in the following forms: as particulate matter that has become mixed with ground materials; as contamination fused with target and TDMR surfaces; and as material in the form of expended ammunition lodged in the target. The DU contamination itself is weakly radioactive, emitting principally alpha particles during the decay process. Alpha particles are unable to penetrate clothing or skin but have the potential to enter the body through open wounds or hand to mouth activities (ORISE 2004). Beta and gamma particles are also emitted from DU contaminated materials; however, the emissions are considered negligible (ORISE 2004).

A biological measure of radiation, roentgen equivalent man (rem), is used to describe absorbed doses of radiation. Direct exposure to the skin from holding a DU penetrator



yields about 0.2 rem (or .002 millirem [mrem]) per hour from beta and gamma radiation (DoD 2000). Even under the unlikely situation of direct exposure over an average work year (assume 40 hours for 50 weeks), the dose would be approximately 4.0 mrem. Table 3-5 presents a comparison of radiation sources.

| Table 3-5 Comparison of Radiation Sources | |
|--|----------------------------|
| <i>Source</i> | <i>Millirem (per year)</i> |
| Medical X-ray | 20 |
| Living in Stone, Brick, or Concrete Building | 7 |
| Watching TV | 1-2 |
| Computer Monitor | 0.1 |
| Luminous Wrist Watch | 0.06 |

Source: Nuclear Energy Institute (NEI 2004).

More important is the toxic effect of DU as a heavy metal. The toxicity characteristics of DU are similar to other heavy metals such as lead, cadmium, nickel, cobalt, and tungsten. When DU is internalized in the body, the soluble components migrate throughout the body and uranium concentrates in the bone, kidney, and liver. The kidney is the most sensitive organ to DU toxicity and has been broadly accepted as the critical organ for uranium toxicity (Ebinger, *et al.* 1990). When the uranium enters the body, it binds with bicarbonate and proteins. This binding action helps prevent soluble uranium from interacting with most body tissues. However, when the bicarbonate-uranium complex enters the kidney, it can potentially damage the kidney tissues. Existing procedures used at the DU library and Target 63-10 prevent the types of contact and exposure needed to cause toxic intake (Air Force 2000). When working in situations with potential uptake of this heavy metal, personal protective equipment (i.e., gloves, coveralls, and respirator) are worn to limit potential alpha radiation exposure through open wounds, burns from metal fragments during cutting, and ingestion or inhalation of airborne DU particles. In addition, gamma dose rate measurements are performed to identify unusual radiological conditions and to ensure the health and safety of personnel (AFIOH 2003a). Qualified technicians operate the equipment used to measure ionized radiation in accordance with frequency and requirements for routine surveys as presented in the *AFIOH Final Work Plan for Decontamination, Survey and Disposal of DU Contaminated Targets* (AFIOH 2003a).

Several studies have been performed at the DU library and Target 63-10 to assess the potential for worker exposure to DU in the course of disturbance activities. A study completed in 1992 (Air Force 1993) under the oversight of the Air Force Armstrong Laboratory Health Physics Function analyzed the worker exposure potential using personal air samplers to determine the extent of respirable hazards. Workers for the study were engaged in the refurbishment of two DU targets within Target 63-10. The results of this study indicated that measurable radioactive contamination was considerably lower than the allowed derived air concentration (DAC) of 0.09 picoCuries per liter of air. None of the individuals monitored during the study activities had measurable contamination on their respirators, and little contamination on their protective clothing and equipment. The study concluded that no significant airborne DU contamination hazard existed (Air Force 1998b, 1993).

Recently, the AFIOH performed a pilot test of the decontamination and unrestricted release of DU and Radium-226 contaminated objects at the DU library (AFIOH 2003b). Thirty targets were examined in the pilot test. Of these, four exhibited damage to dials and gauges signifying possible Radium 226 contamination. A health and safety plan was developed prior to implementation of the study. Personal protective equipment was worn (e.g., gloves, respirator, coveralls). The contamination hazards for personnel performing the pilot study were monitored through the collection of general work area air samples during the decontamination and survey. External exposure potentials to personnel were monitored by hand-held instrumentation and thermoluminescent dosimeters. No measurable doses of radiation contamination in the respirators of the project or ancillary workers were measured or reported during the performance of the project tasks. These tasks included such disturbance activities as physical contaminated material removal from targets, agitation of radioactive contaminated surfaces with wire brushes and similar tools, HEPA vacuuming, cutting away of contaminated material using an oxygen/acetylene torch, and grinding of contaminated surfaces (AFIOH 2003b).

The DU Management Plan (Air Force 2000) outlines basic policies for management of the DU library and Target 63-10, incorporating pertinent provisions of NEPA, the Low-level Radioactive Waste Policy Act, and the NRC regulations that control DU disposal. Based on the findings of the various studies at the affected areas, the Air Force conducts environmental radiological monitoring programs to verify the current locations of DU, determine if DU has migrated on the surface or vertically downward, and locate detectable transmission of DU due to resuspension and wind dispersal.

Transport of the contaminated materials (TDMR and targets) to final disposal locations also involves health and safety. Transportation requirements are well defined by the DOT and state regulations. All drivers and technicians transporting and handling these materials would receive appropriate training. In accordance with the NAC 459.9865, the transporter of radioactive waste must notify the Nevada Highway Patrol Division of the Department of Public Safety not less than 4 hours nor more than 48 hours before transport begins in Nevada. While the transporter maintains responsibility to select a route between the shipper's location and the disposal destination, this selection process would take into account routing options and the radiological risk of transport by considering the following:

1. Known accident rates along potential routes;
2. Transit time;
3. Population density and activities; and
4. Time(s) of day and day(s) of the week that transport will occur.

Transport of LLW to the other proposed disposal sites requires inter-state transport. The National Hazardous Materials Route Registry provides information regarding state-specific limitations and/or route prescriptions for transport of hazardous materials, including radioactive materials and waste. Nevada has not specified limitations or identified preferred routes of transportation for LLW.

As noted previously, the AFIOH conducted radiological assessments on four DU-contaminated unclassified tanks in the DU library selected for disposal at the US Ecology Hazardous Waste Treatment and Disposal Facility in Idaho (Air Force 2004b). to calculate the potential radiation dose to drivers transporting the tanks to the US Ecology site and the workers placing the tanks in the burial site using RESRAD version 6.1. The calculations supported the conclusion that, based on total DU material relative to tank volume (less than 0.05 percent by weight of uranium), the amount of uranium in each tank was an unimportant quantity by RCRA standards and the potential radiation dose to drivers and workers was significantly less than 1 mrem per year.

3.5.2 Environmental Consequences

Health and safety analysis of potential exposure to DU must consider preparation and packaging at the DU library and transport to an approved disposal facility. Methods for disposal would then be addressed by the disposal facility.

Proposed Action

Preparation of the targets and TDMR for disposal would involve activities such as handling, decontamination, cutting, and packaging. All activities would be conducted in accordance with the Radioactive Material Permit NV-30048-02/02 AFP; AFI 40-201; AFI 13-212 *Range Planning and Operations*; the DU Management Plan (Air Force 2000); and the Final Work Plan, decontamination, survey and disposal for DU contaminated targets at Nellis Air Force Base (AFIOH 2003a).

Holding a DU penetrator next to bare skin would yield about 0.002 mrem per hour. The likelihood that this type of exposure would occur during disposal activities is extremely remote. However, if such an occurrence were to take place, on-site personnel could potentially be exposed to about 0.32 mrem of beta radiation (assume 40 hours each week for four working weeks). Since this is improbable, the actual exposure rate of workers would be a fraction of 0.32 mrem and would present no health risk as a result of the packaging, disposal, and transportation activities associated with the DU library and Target 63-10. Although the occupational dose limit for skin exposure to beta radiation is 0.5 mrem per year (10 CFR 20) all protection measures (i.e., protective clothing and respirators) for worker safety would be implemented to further reduce the health risk to on-site personnel.

The Air Force would enforce occupational safety requirements at the DU library and Target 63-10 during maintenance activities. In order to reduce the risk of inhalation hazard, burning or welding of the contaminated targets would be controlled by the Nellis AFB Bioenvironmental Engineering Flight. Personnel would employ proper hygiene practices, such as thoroughly washing hands before eating to reduce the risk of ingestion hazards. To limit external exposure and contamination from entering the body through open wounds, personnel touching DU-contaminated materials would wear gloves. All vehicles, boots, gloves, respirators, and other equipment used during operations would be brushed lightly

to rid the surface of clinging dust particles from the site (AFIOH 2003a). A HEPA vacuum would be used during decontamination procedures.

Handling. Handling of targets from the DU library for loading would require the use of heavy equipment and trucks. This activity may produce disturbance and potential re-introduction of contaminated particulate matter from the ground surface, depending on meteorological conditions at the time. As discussed in Section 3.2, air quality, such particulate matter does not migrate far from its origin, so impacts would be negligible. Required use of respiratory protective equipment by onsite workers would prevent any inhalation exposures associated with the movement of heavy equipment and trucks at the site. Moreover, personnel exposures would be brief, approximately 25 days per year.

Decontamination and Cutting. A different exposure issue relates to the use of an oxygen/acetylene or other high-temperature torch to cut out contaminated areas on a target. An oxygen/acetylene torch achieves flame temperatures of about 3,000 degrees Centigrade. DU can ignite at temperatures of about 600 degrees Centigrade (WHO 2003). Improper procedures could cause ignition of DU, resulting in a potential inhalation exposure. This potential exposure to personnel would be considered low, based on the following established precautions: 1) identification of contaminated areas including embedded penetrators prior to instituting their removal with a torch (AFIOH 2003a); and 2) demarcating a non-contaminated 8- to 12-inch perimeter surrounding the contaminated area to ensure the torch flame does not come close to the contaminated area. In the event of a fire, dry powder would be used to smother flames and personnel would move up wind to avoid inhalation exposure.

Typical handling (e.g., collecting spent munitions) and mechanical cutting would not pose a health or safety risk. Proper protection (e.g., gloves, respirators, coveralls, HEPA vacuums) for workers would prevent contact and other types of exposures.

Transport. For the transport phase of the process, the primary risk factors would stem from a transportation accident, as pre-transport packaging requirements otherwise alleviate exposure risks during movement of the materials. Two transport methods exist for the disposition of the contaminated material to a LLW facility: highway transport via truck and intermodal transfer involving a mixture of highway and railway transport.

Overall, previous studies (Air Force 1998b) demonstrated that the proposed types of preparation activities posed no risk to workers or the surrounding environment. By following procedures for monitoring DU at the DU library and Target 63-10 (Air Force 2000), safety, health, and radiation protection would be ensured.

Although 10 CFR 71, *Packing and Transportation of Radioactive Material* regulates packaging, LLW is exempt from most of the requirements under this regulation. Additionally, packaging must meet state

regulations contained in the NAC, Chapter 459, *Hazardous Materials*, particularly NAC 459.830, *Requirements for Physical Form and Packaging for All [Radioactive Material] Classes*, and for interstate transport, any requirements of the receiving state. In addition to federal and state regulations for waste packaging, the packaging of waste materials must also meet the Waste Acceptance Criteria (WAC) of the receiving disposal site. These criteria are likely to contain more stringent requirements than the general regulations. NTS in Nevada, the proposed classified LLW disposal site, has published WAC.

In the rare event of a transport accident, cleanup of a material release would require addressing both the radiological and toxic hazards of LLW. Cleanup processes would match the activities required for collection and containment of the TDMR and targets at the DU library that must occur in order to initiate disposal activities. Unique exposure concerns and aspects of cleanup would only result with the introduction of unusual contaminant migration pathways such as an accident occurring near a waterway, or an accident resulting in a fire.

The use of intermodal transport for shipment of LLW from the DU library to facilities would require truck transport to an intermodal transportation center. The Air Force would seek an appropriate intermodal facility within a reasonable distance of the NTTR. For example, there is easy vehicular access to a Barstow intermodal facility 160 miles away via U.S. 95, Nevada State Highway 373, California State Highway 127, and U.S. 5.

A report from DOE (1999), evaluated the health and safety considerations of both highway and intermodal transportation alternatives for shipment of LLW nationwide to the NTS. In general, intermodal transport was determined to provide the lowest accident risk. Nationwide, highway transportation remains the more common approach to transportation of hazardous and radioactive materials throughout the United States, though it has a higher accident probability than intermodal transport (DOE 1999). However, the limited number of shipments per year from the DU library, the composition of the shipments, the stringent packaging and safety requirements, as well as the overall low accident probability that exists for the transportation routes, results in an overall minimal probability of exposure to the general public when transporting the DU-contaminated low-level radioactive materials.

For most of the transportation routes that have been described, access to waterways is extremely limited due to the location of the routes in the arid regions of the country. In the unlikely event that an accident were to occur in close enough proximity to a waterway (resulting in the spread of the LLW to the water), the radioactive or hazardous material present in the shipments is not in concentrations high enough to contaminate the food chain or affect the ecosystem (Ebinger, *et al.* 1996). Of the solid contaminated material that could spill, some could be suspended in the water and carried downstream, but the density of most of the material would result in quick settlement to the bottom. DU, like other heavy metals, is insoluble in water and does not migrate readily in soil. Because the likelihood of such an accident is low, and the related consequences are extremely minimal, the associated risk is considered to be very low.

A more serious risk exists if an accident were to result in a fire that could involve the waste shipment. In this accident scenario, the possible ignition of DU could result in an inhalation risk for responders and others located downwind. Although the exposure potential for this scenario is the most significant, an extended burn period is unlikely due to the generally noncombustible nature of a majority of the material (metal) that is contaminated with DU. Additionally, the overall probability of an accident of this nature involving a shipment of LLW is extremely low due to the infrequency of shipments, the general safety of transport, and the extremely low probability of a type of accident resulting in a fire.

Packaging. Packaging would occur at the DU library and could include shrink wrapping, polymer sealant, containerizing, tarp covering, and other methods consistent with WACs and regulations. The methods used would depend on the size and shape of the item as well as adherence with requirements. In all cases, the packaging would prevent DU exposure during transport, thereby minimizing potential impacts.

On-Site Above Ground Monitoring Alternative

Since the alternative would not involve handling, transport, or disposal, already low health and safety risks would be even lower. Employment of safety and protection procedures would prevent worker exposure. As such, impacts would be negligible.

No-Action Alternative

Under the no-action alternative, no handling, transport, or disposal would occur at this time. Therefore, this alternative would produce negligible, if any, effects.

3.6 BIOLOGICAL RESOURCES

Biological resources encompass plant and animal species and the habitats within which they occur. Plant species are often referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the area or environment where sufficient and necessary resources and conditions exist to support a plant or animal (Hall *et al.* 1997). Biological resources addressed in this EA include vegetation, wildlife, special-status species, and waters of the U.S. including wetlands occurring within Target 63-10 and the DU library. Neither transport nor disposal would disturb or affect biological resources. While transport could result in “road kill” of animals, the chances of such events are negligible and no greater than any other vehicle using the same roadways. At the disposal sites, existing facilities have already disturbed the area and disposal of DU-contaminated targets and TDMR would not cause additional disturbance. For these reasons, neither the transport routes nor disposal facilities warrant further consideration relative to biological resources.

3.6.1 Affected Environment

As noted previously, the affected environment for biological resources consists of the area within the DU library and Target 63-10 (refer to Figure 1-2). Baseline biological resources data came from previous studies such as the *Renewal of the Nellis Air Force Range Land Withdrawal, Legislative Environmental Impact Statement* (Air Force 1999) and *Integrated Natural Resource Management Plan for Nellis Air Force Base, Nevada* (NAFB 1999), rare species and wetlands surveys, and site photographs. The Nellis AFB biologist examined the area for evidence of desert tortoise (personal communication, Turner 2004); however, the Air Force conducted no biological field studies for this EA. Long-term (20 years) use of the DU library and Target 63-10 has disturbed the area substantially, thereby altering its habitat.

Vegetation. Vegetation includes all existing terrestrial plant communities with the exception of wetlands or threatened, endangered, or sensitive species. The affected environment for vegetation includes only those areas subject to ground disturbance at Target 63-10 and the DU library. NTTR overlaps two distinct ecoregions: the Mojave Desert to the south and the Great Basin Desert to the north. The Mojave Desert is lower and warmer, receiving most of its precipitation as rain, whereas the Great Basin Desert is higher and colder, receiving more snow. The transition between the two deserts occurs very broadly along the 37th parallel (Air Force 1999). As a result, most of the South Range, including the Target 63-10 and the DU library, lies within the Mojave Desert, whereas most of the North Range transitions to the Great Basin Desert.

The native vegetation of NTTR consists primarily of desert scrub communities at low- to mid-elevations with mixed shrub and woodland communities at mid- to upper-elevations. Montane shrub communities dominate the highest elevations except for small patches of forest vegetation, which are limited to the highest mountain peaks and ridgelines. Some vegetation communities are strongly limited to, and may even be considered indicators of, either the Mojave or Great Basin Desert, whereas others are transitional or occur in both deserts where conditions are suitable (Air Force 1999).

The South Range of NTTR lies in the northeastern portion of the Mojave Desert. Vast areas of the basins and bajadas of the Mojave Desert, below approximately 4,000 feet, commonly support a scrub community dominated by creosote bush (*Larrea tridentate*) and white bursage (*Ambrosia dumosa*). Additional species include saltbushes, ephedras (*Ephedra* spp.), brittlebush (*Encelia virginensis*), desert mallow (*Sphaeralcea ambigua*), cacti, and Mojave yucca (*Yucca shidigera*). Joshua trees (*Yucca brevifolia*) occur and often form a distinctive Mojave Desert woodland community at upper elevations. Where soils are alkaline and clayey, such as valley



bottoms and dry lake beds (playas), four-wing saltbush (*Atriplex canescens*), cattle-spinach (*A. polycarpa*), and shadscale (*A. confertifolia*) dominate the saltbush community. The saltbush community is especially prevalent in a broad transition zone between the Mojave Desert and Great Basin. Mixed scrub vegetation typical of the Mojave Desert occurs on Indian Springs AFAF, where several associations including creosote bush, white bursage, saltbush, and Joshua tree can be distinguished (NAFB 1999).

At higher elevations in the Mojave Desert, approximately 4,000 to 6,000 feet, the blackbrush community may predominate. This community includes blackbrush (*Coleogyne ramosissima*), ephedras, turpentine-broom (*Thamnosma montana*), and range ratney (*Krameria parvifolia*). In the highest mountains of the South Range, pinyon-juniper woodlands develop due to the increased precipitation and lowered temperatures. Single-leaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma* Torr.) are the dominant woody species.

Target 63-10 and the DU library lie within a zone generally characterized by creosote habitat, with white bursage and saltbush as other common species. However, operations and storage have substantially disturbed the affected areas, effectively eliminating most of the native habitat and plants. A study at Target 63-10 (Air Force 1994) conducted by the USFWS attempted to assess the potential for animal species to “uptake” and absorb DU through resuspension of contaminated dusts or ingestion of contaminated vegetation but the scarcity of plants and animals proved difficult for the USFWS to draw a conclusion. Another study (Hanson *et al.* 1976) conducted by Los Alamos Scientific Laboratory analyzed DU contamination in plants and mammals. The study data emphasized resuspension of respirable particles as a contamination mechanism for small mammals and in varying degrees for plants. Other studies (Leggett 1995; Voegtlin *et al.* 1953; Tannenbaum 1951) have been conducted to determine absorption rates of varying forms of ingested uranium indicated lower absorption rates with decreased solubility of the uranium compound. The low solubility of DU used at Target 63-10 indicates a low absorption rate in plants and animals (Air Force 1994).

Wildlife. Wildlife includes all vertebrate animals (i.e., fish, amphibians, reptiles, birds, and mammals) with the exception of those identified as threatened, endangered, or sensitive species. Wildlife also includes those bird species protected under the federal Migratory Bird Treaty Act. Assessment of a project’s effects on migratory birds places an emphasis on “Species of Concern” as defined by Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. Additional assessment of potential impacts to migratory birds that are regionally rare occurs under the special-status category. Due to the presence of the Great Basin and Mojave deserts, the transition zone between them, and the desert springs and riparian areas of the region, NTTR encompasses diverse habitats which support varied and locally abundant animal communities. The range of wildlife supported by this great diversity of habitat, and commonly found within NTTR, includes over 30 species of reptiles, 60 species of mammals, and over 240 species of birds (Air Force 1999).

Wildlife within the area encompassing the Target 63-10 and the DU library includes species that are primarily associated with Mojave desert scrub and woodland habitats. Common mammals of the South Range include coyote (*Canis latrans*), badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), and desert kit fox (*Vulpes macrotis*). These species can be found in all habitat types in low numbers, predominately in areas without heavy human disturbance. Wild burros, which escaped or were released periodically over the last 200 years, are found in low numbers within the creosote bush scrub habitat. Mule deer (*Odocoileus hemionus*), mountain lion (*Felis concolor*), and bobcat (*Lynx rufus*) occur in the mountains of the South Range, well away from the DU-licensed area (Air Force 1999).

Common small mammals include white-tailed antelope squirrel (*Ammospermophilus leucurus*), Merriam's kangaroo rat (*Dipodomys merriami*), long-tailed pocket mouse (*Chaetodipus formosus*), cactus mouse (*Peromyscus eremicus*), and southern grasshopper mouse (*Onychomys torridus*). These rodent species are normally found in loose sandy soils in areas with creosote bushes whereas the canyon mouse (*Peromyscus crinitus*) and desert woodrat (*Neotoma lepida*) are associated with rocky soils, canyons, and Joshua trees.

A bird survey in 1996 documented the presence of 114 avian species on NTTR (NAFB 1999). These species range from common ravens (*Corvus corax*) and cactus wrens (*Campylorhynchus brunneicapillus*) to raptors, including peregrine falcons (*Falco peregrinus*). The report summarized avian use of the desert scrub and higher elevation woodland communities as relatively low through much of the year, particularly for wintering and breeding. Springs and ponds supported the greatest number of birds, although the wetland habitat makes up only a small proportion of NTTR. No springs, ponds, or wetlands exist within at least 5 miles of Target 63-10 and the DU library.

Reptiles are especially adapted to drought conditions and extreme temperatures and are, therefore, well represented in the South Range. The most notable reptile species found in the Mojave creosote scrub habitat is the desert tortoise (*Gopherus agassizii*). Lizard species include side-blotched lizard (*Uta stansburiana*), Western whiptail (*Cnemidophorus tigris*), and others. Snakes include the coachwhip (*Masticophis flagellum*), Great Basin gopher snake (*Pituophis catenifer deserticola*), and the Mojave green rattlesnake (*Crotalus scutulatus scutulatus*).

Several bat species are documented on the range in an NTTR-commissioned bat survey report (Air Force 1999). Six species of bats, of the 20 species potentially occurring in the area, were documented on NTTR including long-legged myotis (*Myotis volans*), fringe-tailed myotis (*Myotis thysanodes*), California myotis (*Myotis californicus*), western pipistrelle (*Pipistrellus hesperus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and pallid bat (*Antrozous pallidus*). The California myotis was the most widespread and commonly observed species in the report and was found in all habitats that were sampled.

As noted previously, long-term disturbance created degraded habitat in and around the DU library and Target 63-10. Therefore, this specific area supports minimal wildlife.

Special-Status Species. Special-status species (i.e., threatened, endangered, or sensitive species) are defined as those species considered rare or in danger of becoming extinct and listed as threatened, endangered, or proposed as such, by the USFWS and/or Nevada Department of Wildlife. Protection of sensitive biological resources is accomplished through the federal Endangered Species Act (ESA), which protects federally-listed threatened and endangered plant and animal species. The State of Nevada also protects plant and animal species listed through the Nevada Revised Statutes and regulations set forth in the Nevada Administrative Code. Although not protected by the ESA, species of concern deserve consideration early in the planning process to help avoid future conflicts that could cause their listing. Additionally, the Nevada Natural Heritage Program maintains a database of state species of concern. Species discussed in this section are state- and federally-listed, or proposed for listing as threatened or endangered, or species of concern, and are known or expected to occur on NTTR. Appendix D contains lists of these special-status species. The only resident special-status species known to occur near the DU library and target array is the federally threatened desert tortoise (Air Force 2003b).

For NTTR, desert tortoise habitat occurs in the areas of the South Range consisting of Mojave Desert scrub. This area within the South Range represents a small percentage of the available desert tortoise habitat within the Northeastern Mojave Recovery Unit. The South Range lies within the extreme northern limits of desert tortoise geographical extent. The NTTR falls within the Coyote Spring Desert Wildlife Management Area, which has been designated as part of the recovery units based on the Desert Tortoise (Mojave Population) Recovery Plan. However, the NTTR is not part of the designated critical habitat areas (USFWS 2003). Designated recovery units contain both “suitable” and “unsuitable” habitat. Some areas within NTTR, such as the impact zones, where the DU library and target array occur, consist of areas considered “unsuitable” or highly disturbed. These areas do not contain nesting, sheltering, or foraging habitat for desert tortoise (USFWS 2003).

Within the affected area several factors influence the potential presence and/or quality of desert tortoise habitat. First, the area includes the effects of substantial past and ongoing disturbance as a result of authorized range use. Target 63-10 lies within an existing DU-firing impact zone containing targets and affected by air-to-ground strafing impacts as well as target clean-up. Also, the DU library is previously disturbed. Second, the USFWS stated in a 2003 Biological Opinion (USFWS 2003) those areas in NTTR such as the defined impact zones are considered “unsuitable” desert tortoise habitat or highly disturbed. Third, there are no designated “recovery areas” for the desert tortoise in the South Range (USFWS 2003). The low to very low probability of desert tortoise within the affected areas is supported by several desert tortoise surveys that have been conducted on the NTTR South Range (Air Force 2003c). These surveys have shown that Range 63 clearly lies near the northern limits of the desert tortoise range. In this area, population densities are generally lower and populations tend to be “patchy” (Revegetation Innovations

1992). Surveys of the South Range have shown a range of density from 1 to 45 desert tortoise per square mile, but areas near to the DU library and target array were estimated to support a population of less than 10 tortoises per square mile (USFWS 2003).

In summary, the accumulated results of these surveys establish that Target 63-10 and DU library affected areas manifest a minimal (at most) potential to support desert tortoise. Most of the habitat is already disturbed, and that over the 12-year period of surveys, no evidence has shown improvement of the habitat quality or increase in tortoise population density. As such, the surveys support the USFWS 2003 Biological Opinion that continued training activity at NTTR would not jeopardize the continued existence of the desert tortoise and would not likely destroy or adversely modify designated critical habitat.

This USFWS programmatic Biological Opinion, issued on June 17, 2003 also concluded that training activities at NTTR would not jeopardize the continued existence of the desert tortoise or destroy or adversely modify critical habitat. The Opinion indicated measures to be taken to minimize desert tortoise mortality or harassment and destruction of habitat. Measures include a maximum speed limit of 35 miles per hour for all regular vehicle travel except during periods of high desert tortoise activity, no off-road travel with the exception of explosive ordnance disposal, presence of a qualified desert tortoise biologist during clean-up activities, removal of desert tortoise from areas of impact by a qualified biologist, installation of tortoise-proof fencing around high risk areas, and development of an approved vegetation rehabilitation plan.

Wetlands and Waters of the United States. Wetlands comprise special category habitats considered sensitive and protected by Section 404 of the Clean Water Act (CWA) and Executive Order 11990 Protection of Wetlands. They include jurisdictional and non-jurisdictional wetlands. Jurisdictional wetlands are those defined by the USACE and USEPA as those areas that meet all the criteria defined in the USACE's *Wetlands Delineation Manual* (USACE 1987). Wetlands are generally associated with drainages, stream channels, and water discharge areas (natural and man-made). Arroyos, playas, ephemeral channels, and wetlands constitute waters of the U.S. and may be subject to regulations under Section 404 of the CWA if their use, degradation, or destruction could affect interstate or foreign commerce. No wetlands of any kind occur within or near Target 63-10 and the DU library.

Surface water sources are extremely limited on NTTR, and none occur within or near the affected areas. Those few water sources in the South Range lie in the mountains or are man-made. Not all playas and other potentially seasonally or ephemerally wet areas have been systematically investigated. However, as these sites are largely unvegetated, they would not qualify as jurisdictional wetlands. Most of NTTR's surface waters have been subjected to modification by humans and heavily impacted by wild horses, limiting their value to wildlife (Air Force 1997).

3.6.2 Environmental Consequences

Determination of the magnitude of potential impacts to biological resources is based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications. Analysis of potential impacts focuses on whether and how target and TDMR disposal activities may affect biological resources.

Proposed Action

Potential sources of impacts to biological resources include vehicle and heavy equipment traffic and noise from these operations. Since the affected environment consists of disturbed vegetation and habitat lacking water sources or wetlands, only a negligible potential for impacts exists. Vehicles used to load and transport targets and TDMR from the DU library might impact area vegetation, but the effect would be negligible since the vegetation has been previously disturbed and no native habitats would be affected.

Wildlife may be disturbed by noise during target preparation and loading activities, yet the brief, localized, and infrequent nature of these events would make any effects minimal and temporary. Direct mortality from vehicles could occur, but its rarity would not affect populations of wildlife. No sightings of the threatened desert tortoise have been recorded in the area and the general habitat conditions for the species in the affected area are poor. The Air Force does not expect to adversely affect desert tortoise populations or their recovery. Several factors support this assessment:

1. While the potentially affected areas fall within the habitat range of the desert tortoise, the USFWS does not consider these areas to be critical habitat. In addition, the potentially affected areas within NTTR (South Range) lie at the northern limits of the tortoise range where population densities are “patchy” (Revegetation Innovations 1992).
2. Due to past disturbance and ongoing training activities, the affected areas consist of unsuitable habitat (USFWS 2003). Target 63-10 lies within an existing ordnance impact zone and the DU library exhibits substantial disturbance.
3. Numerous surveys throughout the valley, where the site is located, indicated that desert tortoise populations are low (1 to 3 tortoise per square mile) to very low (0 tortoise per square mile).

The USFWS concurred that disposal activities at the NTTR DU licensed area, Target 63-10, and the DU library fall under the current activities addressed in the USFWS 2003 Biological Opinion and its Amendment (personal communication Robert Turner and Amy Lavoie 2004). A qualified tortoise monitor would be present prior to and during target and TDMR packaging and transport activities.

On-Site Above Ground Monitoring Alternative

For the on-site above ground monitoring alternative, the Air Force would maintain existing conditions with the periodic addition of air, soil, and water monitoring at the DU library. This would not result in any increased vehicle or heavy equipment impacts. Furthermore, studies established a negligible potential for DU uptake into plants and animals under existing conditions and therefore, no change to current effects is anticipated.

No-Action Alternative

Under the no-action alternative, no change to existing conditions for vegetation, wildlife, or species of concern would occur at this time. The Air Force would not initiate disposal of targets and TDMR from Target 63-10 and the DU library at this time. Annual clean up of DU penetrators from the ground surface would continue.

3.7 CULTURAL RESOURCES

Cultural resources are districts, sites, buildings, structures, or objects considered to be important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. For this EA, cultural resources are divided into three major categories: archaeological resources, architectural resources, and traditional cultural resources.

Archaeological resources are locations where human activity has measurably altered the earth (e.g., hearths, rock alignments, foundations) or left deposits of physical remains (e.g., arrowheads, bottles). For the purposes of this EA, the terms “American Indian” and “early American Indian” are used rather than prehistoric, except where a law or regulation is quoted. The distinction between early American Indian and historic time periods is now viewed as somewhat arbitrary and many American Indians do not distinguish “prehistoric” from “historic.” “Historic” applies to archaeological sites that clearly post-date Euroamerican contact with American Indians (i.e., 19th and 20th centuries). Archaeological resources are usually further classified as either sites or isolates on the basis of quantity, density, and type of cultural material.

Architectural resources are defined as standing buildings, facilities, and other structures potentially having historical, aesthetic, or scientific significance.

Traditional cultural resources are resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. In Nevada, these are usually associated with modern American Indian groups.

Section 106 Process and Consultation. The National Historic Preservation Act and its associated

regulations specify the Section 106 process for determining the impacts of federal actions on properties eligible or recommended as eligible for the National Register of Historic Places (National Register). Eligibility of archaeological and architectural resources is determined by using specific criteria (listed in 36 CFR 60.4). Traditional cultural resources can be evaluated for National Register eligibility as well. However, even if a traditional cultural resource is determined to be not eligible for the National Register, it may still be significant to a particular American Indian tribe and may be protected under the Native American Graves Protection and Repatriation Act, the American Religious Freedom Act, and Executive Order 13007 addressing sacred Indian sites.

For portions of the South Range within DNWR, including Target 63-10 and the DU library, the Air Force and USFWS share responsibility for fulfilling Section 106. Under this proposed action, the Air Force assumed the lead for Section 106. A substantial part of this Section 106 process involved consultation with the Nevada State Historic Preservation Office. The Air Force sent an IICEP letter on March 5, 2004 to start the process (Appendix A). Subsequently, the Air Force submitted (June 16, 2004) a letter of consultation on determination of the effect to the Nevada SHPO (Appendix A). In response, the SHPO replied with a letter on July 15, 2004 concurring with the Air Force's determination of no effect to eligible properties (Appendix B). This completed the Section 106 process and consultation.

The Air Force also sent letters (dated March 5, 2004) describing the proposed action and area of potential effect, which is the acreage within the borders in Figure 1-2, to 37 members of the NAFB Native American Program (NAP) who represent 17 regional tribes with ancestral ties to the NTTR. The tribes are listed in Appendix A. Keith Myhrer, NAFB Archaeologist, and NAP Manager coordinated consultation between the Air Force and the tribes. In 1999, the representatives elected five members to a Document Review Committee (DRC) who would review environmental documents, coordinate with tribal members, and provide comments to represent the members of the NAP from 17 tribes. On November 2, 2004, Richard Arnold, Chair of the Pahrump Paiutes and DRC Coordinator, furnished written comments. They are addressed in this EA. The Committee recommended that the Consolidated Group of Tribes and Organizations accept the findings of the EA.

Methods for identifying and evaluating impacts to National Register-eligible properties included: examination of results from previous surveys conducted adjacent to the area of potential effect; observation of the area of potential effect by the Nellis AFB archaeologist; and assessment of the nature and degree of disturbance at the DU library and Target 63-10.

3.7.1 Affected Environment

The Target 63-10 and the DU library are within the area of potential effect defined by the Air Force. The area of potential effect includes acreage within the DU library and the Target 63-10 array. The boundaries of Figure 1-2 show these areas. This area is heavily disturbed from activities spanning more

than 20 years, include grading, tracked vehicle towing, vehicle traffic, and target storage. The Nellis AFB archaeologist determined the area of potential effect lacked integrity due to previous disturbance and offered a low potential for eligible sites (see Appendix A).

As noted above, the Air Force coordinated with 37 members of the Native American program to identify traditional cultural properties. No member submitted comments on the area or action. Furthermore, research on such resources has continued since 1996 on the cultural and religious importance of the Pintwater Range, located roughly 12 miles northwest of and outside the area of potential effect.

3.7.2 Environmental Consequences

Proposed Action

The Air Force completed efforts to identify and evaluate National Register-eligible properties within the area of potential effect. These efforts demonstrated a high degree of disturbance and a low potential for eligible properties. The Nevada SHPO concurred with the methods used and with a determination of no effect (refer to Appendix B). This concurrence completed the Section 106 process for this action. In the event that archaeological resources are discovered during disposal activities, the activities would cease and standard procedures for unanticipated archaeological discoveries and notification would occur.

On-Site Above Ground Monitoring Alternative

The no effect determination would also apply to implementation of this alternative. Monitoring equipment would cause only negligible ground disturbance in an already disturbed context; conditions would remain unchanged from those found currently.

No-Action Alternative

Under the no-action alternative, disposal of targets and TDMR would not occur at this time. There would be no impact to National Register-eligible resources.

CHAPTER 4

CUMULATIVE EFFECTS, IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

CHAPTER 4

CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.1 CUMULATIVE EFFECTS

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7). Assessing cumulative effects involves defining the scope of the other actions and their interrelationship with the proposed action and alternatives, if they overlap in space and time.

Cumulative effects are most likely to arise when a proposed action is related to other actions that occur in the same location or at a similar time. Actions geographically overlapping or close to the proposed action and alternatives would likely have more potential for a relationship than those farther away. Similarly, actions coinciding in time with the proposed action and alternatives would have a higher potential for cumulative effects.

To identify cumulative effects, three fundamental questions need to be addressed:

1. Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
2. If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
3. If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

4.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time in which the effects could occur. Since the potential impacts of the proposed action are primarily found in Target 63-10 and the DU library, the cumulative effects analysis includes the boundary of the affected area for the proposed action. An action not occurring within or near this area is not considered in the analysis. The time frame for cumulative effects starts in 2005 when DU target and TDMR disposal activities would begin. Public documents prepared by federal, state, and local government agencies were the primary sources of information for identifying reasonable foreseeable actions.

Past and Present Actions

Nellis AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the United States defense policy that the Air Force must be ready to respond to threats to American interests throughout the world. In 2002, the Air Force approved construction of a military operations in urban terrain (MOUT) facility encompassing approximately 97 acres at Silver Flag Alpha Complex on Range 63A with facilities constructed at the Indian Springs AFAF. Construction of the MOUT began in 2002 and will be complete in 2005. In 2003, construction of a high-technology test and training complex (HTTC) encompassing 946 acres on Range 62 was approved by the Air Force (Air Force 2003b). Construction of the HTTC began in 2004 and will conclude in 2008. In 2003, the Air Force implemented a force structure change that will add up to 48 medium- and high-altitude (MQ-1 and MQ-9) Predator unmanned aerial vehicles to the current inventory of 40 predators at Indian Springs AFAF and add 143 personnel to Nellis AFB (Air Force 2003a).

No known past and/or present actions were identified, that when combined with the proposed action would result in any cumulative effects. All past and present actions at NTTR resulting from Air Force activities involving use of the range and airspace would not change from those described in the *Nellis Renewal Legislative Environmental Impact Statement* (Air Force 1999).

Future Proposed Actions

Actions potentially relating to the cumulative effects for the proposed NTTR DU target disposal could include those of the DoD, DOE, Department of the Interior, and local counties. The Air Force proposes to beddown 36 F-35 aircraft at Nellis AFB to establish the F-35 Force Development Evaluation testing and Weapons School. The beddown would begin in fiscal year 2009 reaching the full complement in 2019. An increase of annual airfield operations at Nellis AFB and munitions, chaff, and flare utilization in NTTR airspace would occur under the F-35 proposal.

The Air Force resumed use of DU munitions in 2003. While the Air Force plans to continue firing DU rounds for testing and training at Target 63-10, it also may consider increasing the number of rounds fired annually. Current authorizations permit use of 7,900 DU rounds per year. Any increase of this amount would add to the penetrations and other damage to the targets. However, NTTR management (personal communication, Schofield 2004) estimates that a sufficient number of targets exist within Target 63-10 and the DU library to support DU use for the foreseeable future. As such, the additional DU rounds would not increase the requirements for disposal of targets or TDMR. For this reason, no cumulative effects are anticipated.

Most of these actions have been analyzed previously in the *Nellis Renewal Legislative Environmental Impact Statement* (Air Force 1999). The activities, when evaluated with the proposed action would not

generate additive cumulative effects to the region. Because implementation of the proposed action and alternatives would result in temporary or very minor impacts to the resources analyzed, it is not anticipated that the proposed action or alternatives, when combined with other future proposed actions, would have a negative cumulative effect on other resources.

4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of any irreversible and irretrievable commitment of resources which would be involved in the proposed action or alternatives should they be implemented. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural resource).

For the NTTR DU target disposal initiative, most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary, or longer lasting, but negligible. Those limited resources that may involve a possible irreversible or irretrievable commitment are discussed below.

Personal and contract vehicles to the site would consume fuel, oil, and lubricants. The amount of these materials would not likely exceed that currently used by these individuals conducting similar activities on NTTR. The proposed action and alternatives are not likely to increase consumption of these resources. Materials used in the packaging and transport of targets and TDMR (i.e., wood, plastic, etc) would be committed under the proposed action. The increase in the use of these materials would be minimal.

Packaging and transport activities would occur on previously disturbed areas. While some loss of vegetation could occur, it does not represent native habitat and the amount lost in relation to the near 2.9 million acres of land on NTTR would be negligible. Land used for disposal of DU contaminated targets and TDMR would likely not be used for any other purpose and would therefore represent a loss of that resource.

CHAPTER 5

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CHAPTER 6

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Ferraro, Robert, Mayor. Boulder City, NV. 2004.

Fisher, Bill. Bureau of Land Management, Tonopah Field Station. 2004.

Flynn, Mike, Lt. Col. HQ AWFC/DOR. Nellis AFB, NV. 2003 and 2004.

Gates, Yvonne Atkinson, Commissioner. Clark County Board of Commissioners, NV. 2004.

Gibson, Jim, Mayor. Henderson, NV. 2004.

Goodman, Oscar, Mayor. Las Vegas, NV. 2004.

Hagen, Melissa, Major. ACC/JAV. Langley AFB, VA. 2004.

Hejazi, Sharon. Office of Chief Counsel, National Nuclear Security Administration. NTS, NV. 2004

Hensley, Jerry. AFIOH/SDRH. Brooks AFB, TX. 2003 and 2004.

Izell, Kathy. Office of Chief Counsel, National Nuclear Security Administration. NTS, NV. 2004.

James, Ronald. Nevada SHPO. 2004.

Jenson, Neal. NRC General Counsel. 2004.

Kolkman, Gene. Bureau of Land Management, Ely Field Office. 2004.

Lavoie, Amy. USFWS Las Vegas District. July 26, 2004.

Mather, Kali, Lt Col. AFMSA/SGPR. Bolling AFB, DC. 2004 and 2005.

Morse, Mark. Bureau of Land Management, Las Vegas Field Office. 2004.

Moul, Sue, Lt. Col.. ACC/DOR. Langley AFB, VA. 2004.

Murad, Dale. AF/JACE. Rosslyn VA. 2004 and 2005.

Myhrer, Keith. 99 CES/CEVN. Nellis AFB, NV. 2004.

Nastri, Wayne. USEPA, NV. 2004.

Parker, Sheryl. HQ ACC/CEVP. Langley AFB, VA. 2003 and 2004.

Persoon, Jim. Alliant Techsystems. Minneapolis, MN. 2004.

Renaghan, Brian. AFIOH/SDRE. Brooks AFB, TX. 2004.

Schofield, Roger. 98 RANW/XPL. Nellis AFB, NV. 2003 and 2004.

Skougard, Mike. Department of Energy. NNSA/NSO ESHD. Las Vegas, NV. 2004.

Smyser, Craig, Major. 99 AMAS/SGPB. Nellis AFB, NV. 2004.

Stafford, Michael. Nevada State Clearinghouse. 2004.

Taylor, Willie. U.S. Department of the Interior. 2004.

Turner, Robert. 99 CES/CEVN. Nellis AFB, NV. 2004.

Turnipseed, R. Michael. Department of Conservation and Natural Resources State of Nevada. 2004.

Williams, Robert. USFWS, NV. 2004.

CHAPTER 7

LIST OF PREPARERS AND CONTRIBUTORS

CHAPTER 7

LIST OF PREPARERS AND CONTRIBUTORS

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B.S., Chemical Engineering, Tulane University, 1987

Ph.D., Chemical Engineering, University of Houston, 1992

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A.A.S., Administrative Office Technology, Boise State University, 1999

Years of Experience: 5

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B.A., Chemistry, Mary Baldwin College, 1988

Years of Experience: 15

Chareé D. Hoffman, *Biological Resources, Soils and Water*

B.S., Biology, Christopher Newport University VA, 1999

Years of Experience: 5

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Years of Experience: 6

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B.A., Anthropology, Pomona College, 1975

M.A., Anthropology, Washington State University, 1986

Years of Experience: 24

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B.A., Political Science/German, University of Massachusetts/Amherst, 1980

M.A., International Relations, George Washington University, 1983

M.S., Forest Resource Management, University of Idaho, 1996

Years of Experience: 7

Teresa Rudolph, *Cultural Resources*

B.A., Anthropology, Florida State University, 1975

M.A., Anthropology, Southern Illinois University, 1981

Years of Experience: 23

Patricia Spengler, *Production*

Years of Experience: 22

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B.A., Anthropology, Boise State University, 2001

Years of Experience: 3

APPENDIX A

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

05 MAR 2004

MEMORANDUM FOR: Mr. Robert Williams, State Supervisor
U.S. Fish and Wildlife Service
1340 Financial Blvd, Ste 234
Reno NV 89502-7147

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Disposal of Nevada Test and Training Range (NTTR) Depleted Uranium (DU) Targets

The United States Air Force (Air Force) is in the initial stages of analyzing potential environmental impacts from removing targets used by A-10 aircraft for DU test and training on the NTTR. Under the proposed action, the Air Force will analyze various disposal options relative to DU targets and debris at Target 63-10 (see attached map) on NTTR.

The Environmental Assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969. To initiate the process, scoping meetings will be held at the following locations:

Las Vegas NV – March 23, 2004, 6-8 p.m., Sunrise Library, 5400 Harris Ave.

Indian Springs NV – March 24, 2004, 6-8 p.m., Indian Springs Community Center, 719 West Gretta Lane

Pahrump NV – March 25, 2004, 6-8 p.m., Bob Ruud Community Center, Main Hall, 150 North Highway 160

Pursuant to the analysis of the proposed actions, as well as in compliance with the Endangered Species Act, we would like to request information regarding federally listed and proposed listed species that may be present in the potentially affected area. If any of the information is available digitally, we would appreciate receiving it in that format. Until the extent of the potential impact to listed species is determined, we will make no decision regarding the need for Section 7 consultation.

Please provide responses and direct inquiries on this matter to the EA Project Manager, Ms. Sheryl Parker at (757) 764-9334, or at the above address. Thank you for your assistance in this activity.

PAUL R. GREEN, Ph D
Acting Chief, Environmental Analysis Branch

1 Atch
Map of Affected Areas



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

05 MAR 2004

MEMORANDUM FOR: Mr. Ronald James
State Historic Preservation Office
100 Stewart Street Capitol Complex
Carson City NV 89701-4285

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Disposal of Nevada Test and Training Range (NTTR) Depleted Uranium (DU)
Targets

The United States Air Force is in the initial stages of analyzing potential environmental impacts from removing targets used by A-10 aircraft for DU test and training on the NTTR. Under the proposed action, the Air Force will analyze various disposal options relative to DU targets and debris at Target 63-10 (attached map) on the NTTR.

The purpose of this letter is to initiate the Section 106 process of the National Historic Preservation Act of 1966 in the potentially affected area on the NTTR. We would appreciate any assistance you could provide in this process, as well as concerns you may have about the potential effects of the proposal on significant cultural resources. We will use information collected for the environmental assessment to identify historic properties and consider effects to them, if any. This information will be coordinated with your office according to the steps outlined in 36 CFR 800.3 through 36 CFR 800.7.

Please send your input to HQ ACC/CEVP, 129 Andrews Street, Suite 102, Langley AFB VA 23665-2769. If you have any specific questions about the proposal, please contact the EA Project Manager, Ms. Sheryl Parker at the above address or at (757) 764-9334. In advance, we thank you for your assistance in this activity.

A handwritten signature in black ink, reading "Paul R. Green".

PAUL R. GREEN, Ph D
Acting Chief, Environmental Analysis Branch

1 Atch
Map of Affected Area



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

09 MAR 2004

MEMORANDUM FOR: Mr. Robert Abbey, State Director
Bureau of Land Management
1340 Financial Blvd
Reno NV 89502-7147

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Disposal of Nevada Test and Training Range (NTTR) Depleted Uranium (DU) Targets

The United States Air Force (Air Force) is in the initial stages of analyzing potential environmental impacts from removing targets used by A-10 aircraft for DU test and training on the NTTR. Under the proposed action, the Air Force will analyze various disposal options relative to DU targets and debris at Target 63-10 (see attached map) on NTTR.

The environmental assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969. To initiate the process, scoping meetings will be held at the following locations:

Las Vegas, NV – March 23, 2004, 6-8 p.m., Sunrise Library, 5400 Harris Ave.

Indian Springs, NV – March 24, 2004, 6-8 p.m., Indian Springs Community Center, 719 West Gretta Lane

Pahrump, NV – March 25, 2004, 6-8 p.m., Bob Ruud Community Center, Main Hall, 150 North Highway 160

These meetings will offer the interested public an opportunity to talk one-on-one with Air Force representatives about the proposal, alternatives, as well as the analysis process. It is also an opportunity to comment on any environmental issues and concerns associated with the proposal you may have, as well as offer any additional alternatives that can be considered and analyzed in the EA. If during the preparation of the EA, it is determined that an Environmental Impact Statement (EIS) is warranted, comments received during the scoping period will be considered in the EIS.

In support of this process we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. Please forward any identified issues or concerns to Ms. Sheryl Parker, DU EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334, or the Nellis AFB point of contact, Mr. Jim Campe at 99 CES/CEV, 4349 Duffer Drive, Ste 1601, Nellis AFB, NV 89191 or at (702) 652-5813. We cordially request comments or concerns be sent by 20 Apr 04; however, we will consider comments received at any time during the environmental process to the extent possible.

ROY L. BARKER
Acting Chief, Environmental Analysis Branch

1 Atch
Map of Affected Area

**Nevada Test and Training Range (NTTR)
Depleted Uranium (DU) Target Disposal
IICEP Distribution List**

Mr. Bill Fisher
Bureau of Land Management
Tonopah Field Station
Tonopah NV 89049-0919

Mr. Allen Biaggi, Administrator
Nevada Division of Env Protection
State of Nevada, Capitol Complex
Carson City NV 89706

Mr. Gene Kolkman
Bureau of Land Management-Ely Field Office
Ely NV 89301-9408

Mr. Mark T. Morse, Office Manager
Bureau of Land Management
Las Vegas Field Office
Las Vegas NV 89130-2301

Refuge Manager
Desert National Wildlife Refuge
Las Vegas NV 89108

Nevada Division of Emergency Management
Carson City NV 89711

Mr. Michael Stafford
Nevada State Clearinghouse
Department of Administration
Carson City NV 89701

Nevada Department of Wildlife
Las Vegas NV 89108

Mr. Terry Crawfoth, Administrator
Nevada Department of Wildlife
Reno Headquarters
Reno NV 89512

Mr. Wayne Nastri, Regional Administrator
U.S. EPA, Region IX
Office of the Regional Administrator
San Francisco CA 94105

Mr. R. Turnipseed, Director
Dept. of Conservation and Natural Resources
State of Nevada
Carson City NV 89706-0818



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

05 MAR 2004

MEMORANDUM FOR: The Honorable Maggie Carlton, State Senator

State Senate
5540 Cartwright
Las Vegas NV 89110

FROM: HQ ACC/CEVP

129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Disposal of Nevada Test and Training Range (NTTR) Depleted Uranium (DU) Targets

The United States Air Force (Air Force) is in the initial stages of analyzing potential environmental impacts from removing targets used by A-10 aircraft for DU test and training on the NTTR. Under the proposed action, the Air Force will analyze various disposal options relative to DU targets and debris at Target 63-10 (see attached map) on NTTR.

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Pahrump, NV – March 25, 2004, 6-8 p.m., Bob Ruud Community Center, Main Hall, 150 North Highway 160

These meetings will offer the interested public an opportunity to talk one-on-one with Air Force representatives about the proposal, alternatives, as well as the analysis process. It is also an opportunity to comment on any environmental issues and concerns associated with the proposal you may have, as well as offer any additional alternatives that can be considered and analyzed in the EA. If during the preparation of the EA, it is determined that an Environmental Impact Statement (EIS) is warranted, comments received during the scoping period will be considered in the EIS.

In support of this process we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. Please forward any identified issues or concerns to Ms. Sheryl Parker, DU EA Project Manager at the above address. If you have any questions about the proposal, you may contact her at (757) 764-9334, or the Nellis AFB point of contact, Mr. Jim Campe at 99 CES/CEV, 4349 Duffer Drive, Ste 1601, Nellis AFB, NV 89191 or at (702) 652-5813. We cordially request comments or concerns be sent by 20 Apr 04; however, we will consider comments received at any time during the environmental process to the extent possible.

PAUL R. GREEN, Ph D

Acting Chief, Environmental Analysis Branch

1 Atch
Map of Affected Area

**Nevada Test and Training Range (NTTR)
Depleted Uranium (DU) Target Disposal
IICEP Distribution List**

Assemblyman Kelvin Atkinson
District 17
North Las Vegas NV 89031-5078

Mr. Michael Bingham, Chairman
Indian Springs Town Board
Indian Springs NV 89018

Assemblywoman Vonne Chowning,
District 28
North Las Vegas NV 89030-6401

Ms. Patricia Cox, Commissioner
Nye County Board of Commissioners
Tonopah NV 89049

Honorable Robert Ferraro
Mayor of Boulder City
Boulder City NV 89005

Honorable Oscar B. Goodman
Mayor of Las Vegas
Las Vegas NV 89101

Ms. Yvonne Atkinson Gates, Commissioner
Clark County Board of Commissioners
Las Vegas NV 89155

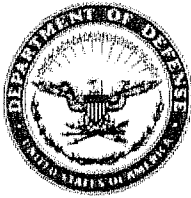
Assemblyman Chad Christenson
District 13
Las Vegas NV 89117-5799

Ms. Joni Eastley, Commissioner
Nye County Board of Commissioners
Tonopah NV 89049

Ms. Midge Carver, Commissioner
Nye County Board of Commissioners
Tonopah NV 89049

Assemblyman Jerry Claborn
District 19
Las Vegas NV 89156-7015

Honorable Jim Gibson
Mayor of Henderson
Henderson NV 89015



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

05 MAR 2004

MEMORANDUM FOR: Ms. Clara Belle Jim
Pahrump Paiute Tribe
1481 Palm Street, #109
Las Vegas NV 89104

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Disposal of Nevada Test and Training Range (NTTR) Depleted Uranium (DU)
Targets

The United States Air Force (Air Force) is in the initial stages of analyzing potential environmental impacts from removing targets used by A-10 aircraft for DU test and training on the NTTR. Under the proposed action, the Air Force will analyze various disposal options relative to DU targets and debris at Target 63-10 (attached map) on NTTR. Although the proposal does not involve construction, should any cultural resource surveys relevant to the proposal be required, they would occur in accordance with current Nellis Air Force Base (AFB) cultural survey protocol and include Native American Interaction Program members as escorts.

The environmental assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969. To initiate the process, scoping meetings will be held at the following locations:

Las Vegas, NV – March 23, 2004, 6-8 p.m., Sunrise Library, 5400 Harris Ave.

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These meetings will offer the interested public an opportunity to talk one-on-one with Air Force representatives about the proposal, alternatives, as well as the analysis process. It is also an opportunity to comment on any environmental issues and concerns associated with the proposal you may have, as well as offer any additional alternatives that can be considered and analyzed in the EA. If during the preparation of the EA, it is determined that an Environmental Impact Statement (EIS) is warranted, comments received during the scoping period will be considered in the EIS.

**Nevada Test and Training Range (NTTR)
Depleted Uranium (DU) Target Disposal
IICEP Distribution List**

Richard Arnold
Pahrump Paiute Tribe
Pahrump NV 89041

Carmen Bradley
Kaibab Band of Southern
Paiutes
Pipe Springs AZ 86022

Gloria Hernandez
Las Vegas Paiute Tribe
Las Vegas NV 89106

Georgia Kennedy
Timbisha Shoshone Tribe
Death Valley CA 92328

Edward Smith
Chemehuevi Indian Tribe
Havas Lake CA 92363

Doug Vega
Bishop Paiute Indian Tribe
Bishop CA 93514

Kenny Anderson
Las Vegas Paiute Tribe
Las Vegas NV 89124

Jerry Charles
Ely Shoshone Tribe
Ely NV 89301

Darlene Dewey
Yomba Shoshone Tribe
Gabbs NV 89409

Pauline Esteves
Timbisha Shoshone Tribe
Death Valley CA 92328

Jessica Bacoch
Big Pine Paiute Tribe of the
Owens Valley
Big Pine CA 93513

Daniel Eddy Jr.
Colorado River Indian Tribes
Parker AZ 85344

Rachel Joseph
Lone Pine Paiute-Shoshone
Tribe
Lone Pine CA 93545

Victor McQueen Sr.
Ely Shoshone Tribe
Ely NV 89301

Philbert Swain
Moapa Band of Paiutes
Moapa NV 89025

Richard Wilder
Fort Independence Indian
Tribe
Independence CA 93526

Felton Bricker
Fort Mojave Tribe
Mohave Valley AZ 86440

Lee Chavez
Bishop Paiute Indian Tribe
Bishop CA 93514

Brenda Drye
Kaibab Band of Southern
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Fredonia AZ 86022

Maurice Frank-Churchill
Yomba Shoshone Tribe
Austin NV 89310

James Birchim
Yomba Shoshone Tribe
Austin NV 89310

Nora Helton
Fort Mojave Tribe
Needles CA 92363

Lori Harrison
Chairwoman of the Board of
Directors
Las Vegas NV 89106

Rose Saulque
Benton Paiute Indian Tribe
Benton CA 93512

Lora Tom
Paiute Indian Tribes of Utah
Cedar City UT 84720

Alfreida Walker
Duckwater Shoshone Tribe
Duckwater NV 89314

Lisa Cagle
Yomba Shoshone Tribe
Austin NV 89310

Betty Cornelius
Colorado River Indian Tribes
Parker AZ 85344

Las Vegas Paiute Tribe
Las Vegas NV 86022

Grace Goad
Timbisha Shoshone Tribe
Death Valley CA 92328

Bill Helmer, Tribal Historic
Preservation Officer
Timbisha Shoshone Tribe
Death Valley CA 92328

Gerald Kane
Bishop Paiute Indian Tribe
Bishop CA 93514

Cynthia Lynch
Pahrump Paiute Tribe
Pahrump NV 89041

Eleanor Hemphill
Fort Independence Indian
Tribe
Independence CA 93526

Darryl King
Chemehuevi Indian Tribe
Havas Lake CA 92363

Tara Marlowe
Paiute Indian Tribes of Utah
Cedar City UT 84720

Lawanda Laffoon
Parker AZ 85344



DEPARTMENT OF THE AIR FORCE

99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA 89191

Ms. Eloisa V. Hopper
Chief, Environmental Flight
99 CES/CEV
4349 Duffer Drive, Ste 1601
Nellis Air Force Base, NV 89191-7007

16 Jun 2004

Ms. Alice Baldrice
Deputy State Historic Preservation Officer
State Historic Preservation Office
100 North Stewart Street
Carson City NV 89710-4285

Dear Ms. Baldrice

The U.S. Air Force proposes to implement disposal options for depleted uranium-contaminated (DU) targets and munitions from the north end of Three Lakes Valley South (dry) between the Desert and Pintwater Ranges, Clark County, Nevada. The federal action involves removal of target residue with surface impacts.

The DU Area of Potential Effect (APE) and a large buffer zone is 1,000 acres shown on the map in Attachment 1. Based on a field inspection by 98th Range Wing professionals and observations by the Nellis Archaeologist during an inventory in 1998 one mile south, approximately 70 percent of the area has been impacted by mission-related activities. They include grading, target construction, and vehicle traffic initiated in the 1970's. The attached aerial photograph in Attachment 2 shows the APE and a variety of types of disturbance from grading, tracked vehicle towing, vehicle traffic, and target vehicle storage. Non-mission essential activity continues to be prohibited in this zone due to risk of exposure to DU contamination.

Previous inventory in the 25-mile long valley that includes two dry lakes and the APE indicates low potential for the presence of eligible sites. Recent field research supports the prediction. In 1998, your office concurred with a no adverse effect determination for 7,500 acres with its boundary one mile south of the APE, based on 45% sampling (8 Apr 1998). In 2002, the Nellis Air Force Base Native American Document Review Committee and your office concurred with a no adverse effect determination of 12,000 acres for Dog Bone Dry Lake target zone, one mile north of the APE (25 Mar 2002).

Global Power For America

Due to the relatively high percentage of previous surface-disturbance that affects physical integrity, I request your concurrence on a determination of *lack of integrity* and an absence of potential to affect historic properties for the DU Target Disposal federal action APE outlined on Attachment 1. If you have questions please contact Mr Keith Myhrer, Nellis Archaeologist, 99 CES/CEVN (702) 652-9365 or E-Mail: keith.myhrer@nellis.af.mil.

Sincerely

ELOISA V. HOPPER
Chief, Environmental Flight

Attachments:

1. Map of DU APE
2. Aerial photograph



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

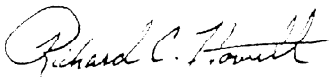
24 FEB 2004

MEMORANDUM FOR National Nuclear Security Administration
Nevada Site Office
P.O. Box 98518
Las Vegas, NV 89193-5818
ATTN: Ms. Kathleen Carlson

FROM: HQ ACC/CE
129 Andrews St., Ste 102
Langley AFB VA 23665-2769

Subject: Cooperating Agency Request for Nevada Test and Training Range Depleted
Uranium Target Disposal Environmental Assessment

1. The Air Force requests your formal participation in preparation of an Environmental Assessment (EA) for the proposed disposal of depleted uranium target debris located on Range 63 of the Nevada Test and Training Range. Our request for participation is based on guidance in the President's Council on Environmental Quality National Environmental Policy Act (NEPA Regulations, 40 CFR § 1501.6 *Cooperating Agencies*).
2. As a cooperating agency, the Air Force requests you participate in various portions of the EA development as may be required. This includes: (a) participating in the scoping process; (b) assuming responsibility, upon Air Force request, for developing information and preparing analyses on issues for which you have special expertise; (c) making staff support available to enhance interdisciplinary review capability; and (d) responding, in writing to this request.
3. We look forward to working closely with the National Nuclear Security Administration to produce an environmental analysis that meets the needs of both organizations. Should your staff have further questions regarding this request, please have them call our Headquarters Air Combat Command Environmental Analysis Point of Contact Ms. Sheryl Parker, at (757) 764-9334.


RICHARD C. HOWELL
Colonel, USAF
Deputy Civil Engineer

cc:
HQ USAF/ILEB
HQ ACC/DOR
AWFC/PA
99 CES/CEV
98 RANG

Global Power For America

APPENDIX B

AGENCY RESPONSES TO INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502
(775) 861-6300 ~ Fax: (775) 861-6301



April 8, 2004
File No. 1-5-04-SP-458

Ms. Sheryl Parker, EA Project Manager
Headquarters Air Combat Command/CEVP
129 Andrews Street, Suite 102
Langley AFB, Virginia 23665-2769

Dear Ms. Parker:

Subject: Species List for Proposed Disposal of Nevada Test and Training Range
Depleted Uranium Targets, Clark County, Nevada

This letter is in response to your request dated March 5, 2004 and received by our office on March 11, 2004, for information regarding federally listed and proposed species that may be present in the area to be potentially affected by the disposal of Nevada Test and Training Range (NTTR) depleted uranium targets. The letter states that under the proposed action, the Air Force will analyze various disposal options relative to depleted uranium targets and debris at Target 63-10 on the NTTR.

1. Given that the project is in only the scoping process and the lack of detailed information regarding potential disposal locations, we are unable to provide a specific list of federally listed species. Please find enclosed a list of federally listed species for the State of Nevada.
2. A map was provided with your letter showing the location of Depleted Uranium Licensed Area (DULA) and Target 63-10 in Range 63 of the NTTR. Any activities to remove depleted uranium debris and targets from this area, or dispose of materials in this location may affect the desert tortoise (*Gopherus agassizii*) (Mojave population), a species listed as threatened. The general area depicted on the map provides suitable Mojave desert scrub habitat for the desert tortoise and the species is known to occur in the vicinity.

This response fulfills the requirement of the Fish and Wildlife Service (Service) at this time to provide a list of species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), for projects that are authorized, funded, or carried out by a Federal agency. When alternatives or options for potential disposal sites are better defined, please contact us for a more detailed list of federally listed species that may be affected by the proposed disposal activities. In general, we prefer the disposal site(s) be located in previously

disturbed areas where no federally listed species or State sensitive species occur in or within the vicinity of the proposed area(s).

The Nevada Fish and Wildlife Office no longer provides species of concern lists. Most of these species for which we have concern, are also on the sensitive species list for Nevada maintained by the State of Nevada's Natural Heritage Program (Heritage). Instead of maintaining our own list, we are adopting Heritage's sensitive species list and partnering with them to provide distribution data and information on the conservation needs for sensitive species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or are in serious decline. Consideration of these sensitive species and exploring management alternatives early in the planning process can provide long-term conservation benefits and avoid future conflicts.

For a list of sensitive species by county, visit Heritage's website at www.heritage.nv.gov. For a specific list of sensitive species that may occur in the vicinity of the DULA or at potential disposal locations, you can obtain a data request form from the website or by contacting Heritage at 1550 East College Parkway, Suite 137, Carson City, NV 89706, 775-687-4245. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the Endangered Species Act. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address. Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (see <http://www.leg.state.nv.us/NAC/NAC-503.html>). Before a person can hunt, take, or possess any parts of wildlife species classified as protected, they must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife (visit <http://www.ndow.org> or call 702-486-5127).

We are concerned that project activities may impact the Gila monster (*Heloderma suspectum cinctum*) and the halfring milkvetch (*Astragalus mohavensis* var. *hemigyryus*), two species that could potentially occur within the vicinity of the DULA. The Gila monster is listed as a sensitive species under the Heritage Program and as a protected species under Nevada State law. The banded Gila monster resides primarily in the Mojave desert scrub and salt desert scrub ecosystems in southern Nevada, southeastern California, southwestern Utah, and western Arizona. The Gila monster is one of only two venomous lizard species in the world. Gila monsters are difficult to locate as they spend the majority of the year in underground burrows; however, illegal collection, construction of roads, and loss of habitat continue to threaten this sensitive reptile. Given that the Gila monster may occur within the project area, we encourage you to minimize project impacts to any existing populations and suitable habitat for this species.

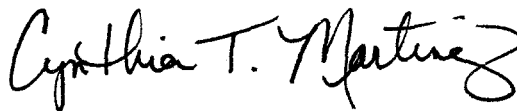
The halfring milkvetch is listed as sensitive under the Heritage Program and as critically endangered by the State of Nevada under Nevada Revised Statutes (NRS) 527.260-.300. For this

plant species, no member of its kind may be removed or destroyed at any time by any means except under special permit issued by the State Forester (NRS 527.270). Requests for permits should be directed to the State Forester, Nevada Division of Forestry at 2525 South Carson Street, Carson City, Nevada 89701, (775) 684-2500. It should be noted that many of the plant species on the State's critically endangered list are not federally listed by the Service because of the protection afforded to them under the State law. Consideration of this species during project planning and early coordination with the State is important to assist with species conservation efforts and to prevent the need for Federal listing actions in the future.

Based on the Service's conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 et seq.), we are concerned about potential impacts the proposed action may have on migratory birds. Given these concerns, we recommend that any land clearing or other surface disturbance associated with proposed actions be timed to avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Please reference File No. 1-5-04-SP-458 in future correspondence concerning this species list. If you have any questions regarding this correspondence or require additional information, please contact Amy LaVoie in our Southern Nevada Field Office at (702) 515-5230.

Sincerely,



for Robert D. Williams
Field Supervisor

Enclosure

cc:

Supervisory Biologist - Habitat, Nevada Department of Wildlife, Las Vegas, Nevada
Regional Forester, Southern Region 3, Nevada Division of Forestry, Las Vegas, Nevada

ENCLOSURE

U. S. FISH AND WILDLIFE SERVICE NEVADA FISH AND WILDLIFE OFFICE

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES OF NEVADA (Updated October 30, 2003)

| Species | Federal Status | Critical Habitat in NV | Recovery Plan |
|---|----------------|------------------------|---------------|
| Birds | | | |
| Western yellow-billed cuckoo, <i>Coccyzus americanus occidentalis</i> | C | N/A | N/A |
| Southwestern willow flycatcher, <i>Empidonax traillii extimus</i> | E | N | N |
| Bald eagle, <i>Haliaeetus leucocephalus</i> ★ | T | N | Y |
| Yuma clapper rail, <i>Rallus longirostris yumanensis</i> | E | N | Y |
| Reptile | | | |
| Desert tortoise, <i>Gopherus agassizii</i> (Mojave population) | T | Y | Y |
| Amphibians | | | |
| Columbia spotted frog, <i>Rana luteiventris</i> (Great Basin population) | C | N/A | N/A |
| Mountain yellow-legged frog, <i>Rana muscosa</i> (Sierra Nevada Distinct Population Segment) | C | N/A | N/A |
| Relict leopard frog, <i>Rana onca</i> | C | N/A | N/A |
| Fishes | | | |
| Warner sucker, <i>Catostomus warnerensis</i> | T | N | Y |
| Cui-ui, <i>Chasmistes cujus</i> | E | N | Y |
| White River springfish, <i>Crenichthys baileyi baileyi</i> | E | Y | Y |
| Hiko White River springfish, <i>Crenichthys baileyi grandis</i> | E | Y | Y |
| Railroad Valley springfish, <i>Crenichthys nevadae</i> | T | Y | Y |
| Devils Hole pupfish, <i>Cyprinodon diabolis</i> | E | N | Y |
| Ash Meadows Amargosa pupfish, <i>C. nevadensis mionectes</i> | E | Y | Y |
| Warm Springs pupfish, <i>Cyprinodon nevadensis pectoralis</i> | E | N | Y |
| Pahrump poolfish, <i>Empetrichthys latos</i> | E | N | Y |
| Desert dace, <i>Eremichthys acros</i> | T | Y | Y |
| Humpback chub, <i>Gila cypha</i> * | E | N | Y |
| Bonytail chub, <i>Gila elegans</i> | E | Y | Y |
| Pahranagat roundtail chub, <i>Gila robusta jordani</i> | E | N | Y |
| Virgin River chub, <i>Gila seminuda</i> ^a | E | Y | Y |
| White River spinedace, <i>Lepidomeda albivallis</i> | E | Y | Y |
| Big Spring spinedace, <i>Lepidomeda mollispinis pratensis</i> | T | Y | Y |
| Moapa dace, <i>Moapa coriacea</i> | E | N | Y |
| Lahontan cutthroat trout, <i>Oncorhynchus clarki henshawi</i> | T | N | Y |
| Woundfin, <i>Plagopterus argentissimus</i> | E | Y | Y |
| Colorado pikeminnow, <i>Ptychocheilus lucius</i> * | E | N | Y |
| Independence Valley speckled dace, <i>Rhinichthys osculus lethoporus</i> | E | N | Y |
| Ash Meadows speckled dace, <i>R. osculus nevadensis</i> | E | Y | Y |
| Clover Valley speckled dace, <i>R. osculus oligoporus</i> | E | N | Y |
| Bull trout, <i>Salvelinus confluentus</i> (Jarbidge River Distinct Population Segment) | T | N | N |
| Razorback sucker, <i>Xyrauchen texanus</i> | E | Y | Y |

**U. S. FISH AND WILDLIFE SERVICE
NEVADA FISH AND WILDLIFE OFFICE**

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES OF NEVADA
(Updated October 30, 2003)

| Species | Federal Status | Critical Habitat in NV | Recovery Plan |
|---|----------------|------------------------|---------------|
| Invertebrates | | | |
| Ash Meadows naucorid, <i>Ambrysus amargosus</i> | T | Y | Y |
| Elongate mud meadows Pyrg, <i>Pyrgulopsis notidicola</i> | C | N/A | N/A |
| Carson wandering skipper, <i>Pseudocopaeodes eunus obscurus</i> | E | N | N |
| Plants | | | |
| Ash Meadows milkvetch, <i>Astragalus phoenix</i> | T | Y | Y |
| Spring-loving centaury, <i>Centaurium namophilum</i> | T | Y | Y |
| Ash Meadows sunray, <i>Enceliopsis nudicaulis</i> var. <i>corrugata</i> | T | Y | Y |
| Steamboat buckwheat, <i>Eriogonum ovalifolium</i> var. <i>williamsiae</i> | E | N | Y |
| Ash Meadows gumplant, <i>Grindelia fraxinoprattensis</i> | T | Y | Y |
| Ash Meadows ivesia (mousetail), <i>Ivesia eremica</i> (= <i>I. kingii</i> var. <i>eremica</i>) | T | Y | Y |
| Webber ivesia, <i>Ivesia webberi</i> | C | N/A | N/A |
| Ash Meadows blazing star, <i>Mentzelia leucophylla</i> | T | Y | Y |
| Amargosa niterwort, <i>Nitrophila mohavensis</i> | E | N | Y |
| Soldier Meadows cinquefoil, <i>Potentilla basaltica</i> | C | N/A | N/A |
| Tahoe yellowcress, <i>Rorippa subumbellata</i> | C | N/A | N/A |
| Ute lady's tresses, <i>Spiranthes diluvialis</i> | T | N | D |

E = Endangered; T = Threatened; C=Candidate; ★ = Proposed for delisting


Y = Yes; N = No; D = Draft; N/A = Not Applicable

* = Believed extirpated from Nevada;

^a Endangered only in the Virgin River; population in Muddy River is species of concern.

**Fish and Wildlife Service
Southern Nevada Field Office
4701 N. Torrey Pines Dr.
Las Vegas, NV 89130**

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Ms. Sheryl Parker
EA Project Manager
Headquarters Air Combat Command/CEVP
129 Andrews St Ste 102
Langley AFB VA 23665-2769


| Year | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | |

| Case | Age | Sex | Occupation | Duration of symptoms | Onset | Course | Outcome |
|------|-----|-----|---------------|----------------------|----------|----------|---------|
| 1 | 25 | M | Student | 10 days | Acute | Recovery | Good |
| 2 | 30 | F | Housewife | 15 days | Subacute | Recovery | Good |
| 3 | 35 | M | Teacher | 20 days | Chronic | Recovery | Good |
| 4 | 40 | F | Office worker | 25 days | Chronic | Recovery | Good |
| 5 | 45 | M | Farmer | 30 days | Chronic | Recovery | Good |
| 6 | 50 | F | Retiree | 35 days | Chronic | Recovery | Good |
| 7 | 55 | M | Businessman | 40 days | Chronic | Recovery | Good |
| 8 | 60 | F | Homemaker | 45 days | Chronic | Recovery | Good |
| 9 | 65 | M | Retiree | 50 days | Chronic | Recovery | Good |
| 10 | 70 | F | Homemaker | 55 days | Chronic | Recovery | Good |



STATE OF NEVADA
DEPARTMENT OF CULTURAL AFFAIRS
Nevada State Historic Preservation Office
100 N. Stewart Street
Carson City, Nevada 89701
(775) 684-3448 • Fax (775) 684-3442
www.nvshpo.org

KENNY C. GUINN
Governor

SCOTT K. SISCO
Interim Director

RONALD M. JAMES
State Historic Preservation Officer

July 15, 2004

Eloisa V. Hopper
Chief Environmental Flight
99 CES/CEV
4349 Duffer Drive Suite 1601
Nellis Air Force Base NV 89191-7007

RE: Disposal Options for Depleted Uranium-Contaminated Targets and
Munitions, Three Lakes Valley, Clark County.

Dear Ms. Hopper:

The Nevada State Historic Preservation Office (SHPO) reviewed the proposed undertaking. The SHPO concurs with the U.S. Air Force's determination that the proposed undertaking is highly disturbed and it is unlikely that historic properties would be present in the project area. The U.S. Department of the Air Force has made a reasonable and good faith effort to identify historic properties that could be affected by the undertaking.

The SHPO concurs with the U.S. Department of the Air Force's determination that historic properties will not be affected by the proposed undertaking.

If you have any questions concerning this correspondence, please contact me by phone at (775) 684-3443 or by E-mail at rlpalmer@clan.lib.nv.us.

Sincerely,

Rebecca Lynn Palmer
Historic Preservation Specialist



Department of Energy
National Nuclear Security Administration
Nevada Site Office
P.O. Box 98518
Las Vegas, NV 89193-8518

MAR 24 2004

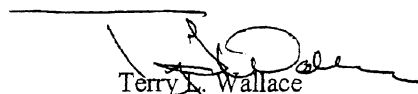
Colonel Richard C. Howell, USAF
Deputy Civil Engineer
HQ ACC/CE
129 Andrews St., Ste. 102
Langley AFB, VA 23665-2769

**COOPERATING AGENCY REQUEST FOR NEVADA TEST SITE (NTS) AND TRAINING
RANGE DEPLETED URANIUM TARGET DISPOSAL ENVIRONMENTAL
ASSESSMENT (EA)**

Reference your letter dated February 24, 2004, subject as above.

In response to the above referenced letter, the National Nuclear Security Administration Nevada Site Office (NNSA/NSO) is pleased to accept your invitation to participate as a cooperating agency in the subject National Environmental Policy Act process. NNSA/NSO staff is prepared to participate in support of the development of the EA. We can provide substantial support in all areas related to radioactive materials and waste, including handling, storage, transportation, disposal, and all aspects of the NTS.

The primary point of contact for this office is Michael G. Skougard (702-295-1759, e-mail skougard@nv.doe.gov), and the secondary point of contact is Linda M. Cohn (702-295-0077, e-mail cohn1@nv.doe.gov). Mr. Skougard and Ms. Cohn will coordinate all data requests and other contacts made to this office related to the EA. If you have any questions, please contact Kenneth A. Hoar, Director, Environment, Safety & Health Division, at (702) 295-1428.


Terry L. Wallace
Assistant Manager
for Safety & Security Programs

ESHD:MGS-4139
ENV 11-10

cc:

Eloisa Hooper, USAF, Las Vegas, NV
James Campe, USAF, Las Vegas, NV
Col. R. H. Zielinski, USAF/NNSA
Liaison Ofc., NNSA/NSO, Las Vegas, NV
Lt. Col. R. E. Ziebarth, USAF, NNSA/NSO,
Las Vegas, NV

APPENDIX C

AIR QUALITY

Appendix C
Final, March 2005

| Air Quality Emissions Calculations | | | | | | | | | | | | | | | |
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APPENDIX D

STATE AND FEDERAL LISTED SPECIES POTENTIALLY FOUND WITHIN THE VICINITY OF THE PROPOSED ACTION AT NEVADA TEST AND TRAINING RANGE

APPENDIX D

STATE AND FEDERAL LISTED SPECIES POTENTIALLY FOUND WITHIN THE VICINITY OF THE PROPOSED ACTION AT NEVADA TEST AND TRAINING RANGE

The following provides a list of all state and federally listed plant species potentially found within the NTTR. These lists include the common and scientific names, state and federal rankings, and brief description of potential habitat where the species are commonly found.

| Table D-1 Special Status Plant Species Known or Likely to Occur on NTTR within the Vicinity of the Proposed Action (page 1 of 3) | | | | |
|---|--|--------------------------------------|---|--|
| <i>Scientific Name</i> <i>Common Name</i> | <i>Regulatory Status¹</i> | <i>Heritage Rank²</i> | <i>Description, Flowering, Period</i> | <i>Distribution and Habitat (reference)</i> |
| <i>Arctomecon californica</i> Las Vegas bearpoppy | SOC, CE | | Cespitose perennial herb, with 6-20 yellow flowers on each stalk; flowers April-May | On barren slopes, flats, and hummocks, often on gypsum soils, in creosote bush scrub, 1,310-2,760 feet. |
| <i>Artomecon merriami</i> Merriam's bearpoppy | SOC, BLM | G3S2 | Clumped perennial herb, with white flowers borne singly on stalks; flowers April-June | Shallow gravelly soils, limestone outcrops, flats and dry lake beds, in various Mojave Desert scrub communities, 2,000-6,300 feet. |
| <i>Asclepias eastwoodiana</i> Eastwood milkweed | SOC, BLM | G2S2 | Low, few-stemmed perennial herb from woody caudex; flowers May-June | Occurs in low alkaline clay hills or shallow, gravelly drainages, in shadscale scrub, 5,300-6,900 feet. |
| <i>Astragalus amphioxus</i> var. <i>musimonum</i> Sheep Range milkvetch | SOC, BLM | G5T2S2 | Low tufted perennial herb; flowers April- June | On dry limestone bajadas, gentle slopes, disturbed areas, in mixed Mojave Desert scrub and pinyon- juniper woodland, 4,400- 6,400 feet. |
| <i>Astragalus beatleyae</i> Beatly milkvetch | SOC, CE | G2S2 | Dwarf, cespitose perennial herb; flowers in May | On shallow, gravelly rhyolitic tuff soil, in barren areas, mixed scrub, and pinyon-juniper woodland, 5,600-6,800 feet. |
| <i>Astragalus funereus</i> Black wollypod | SOC, BLM | G2S2 | Mat-forming perennial herb; flowers March- May | On steep, gravelly slopes of volcanic tuff, occasionally on limestone screes, in barren areas and shadscale scrub, 3,200-7,680 feet. |
| <i>Astragalus mohavensis</i> var. <i>hemigyris</i> Half-ring pod milkvetch | SOC, CE | G3T2S2 | Bushy perennial herb; flowers April-June | On limestone ledges and gravelly hillsides, with creosote, juniper, 3,400- 6,070 feet. |

| Table D-1 Special Status Plant Species Known or Likely to Occur on NTTR within the Vicinity of the Proposed Action (page 2 of 3) | | | | |
|---|---------------------------------------|-----------------------------------|---|---|
| <i>Scientific Name</i> <i>Common Name</i> | <i>Regulatory Status</i> ¹ | <i>Heritage Rank</i> ² | <i>Description, Flowering, Period</i> | <i>Distribution and Habitat (reference)</i> |
| <i>Astragalus oophorus</i> var. <i>clokeyanus</i> Clokey eggvetch | SOC | | Low, slender perennial herb; flowers June-July | On NTTR in washes bordering pinyon-juniper; elsewhere on ridges and slopes in gravelly limestone soil, in sagebrush scrub, pinyon-juniper woodland, and montane forest, 6,800-9,100 feet. |
| <i>Camissonia megalantha</i> Cane Spring evening primrose | SOC | G1S2 | Annual herb; flowers in May or June-October | In washes on volcanic soils and on a talus seepage slope at Cane Spring, in shadscale scrub. |
| <i>Castilleja martinii</i> var. <i>clokeyi</i> Clokey paintbrush | SOC | G3T2S2 | Perennial herb; flowers June-July | On mountains in sagebrush scrub, pinyon-juniper woodland, ponderosa pine-white fir forest, 6,200-9,000 feet. |
| <i>Cymopterus ripleyi</i> var. <i>saniculoides</i> Sanicle biscuitroot | SOC, BLM | G1S1 | Perennial herb; flowers in April-June | On sand dunes, sandy soil, volcanic tuff, in shadscale scrub, 3,900-6,800 feet. |
| <i>Erigeron ovinus</i> Sheep fleabane | SOC, BLM | G1S1 | Perennial herb from taproot; flowers in June | On limestone outcrops in pinyon-juniper woodland, 6,200-8,400 feet. |
| <i>Erigonium corymbostem</i> var. <i>glutinosum</i> Golden buckwheat | SOC | G5T3 S1S2 | Large yellow-flowered shrub; flowers July-October | On fire or sandy soils in mixed desert shrub communities. |
| <i>Frasera pahutensis</i> Pahute green gentian | SOC, BLM | G2S2 | Low, spreading perennial herb arising from woody rootstocks; flowers May-July | On gravelly slopes and valley bottoms, in pinyon-juniper woodland, 7,200-7,900 feet. |
| <i>Galium hilendiae</i> ssp. <i>kingstonense</i> Kingston bedstraw | SOC, BLM | G4T2S2 | Dioecious, mat-forming, weak-stemmed perennial subshrub; flowers in June | On loose, rocky soil in ravines and gullies, in sagebrush scrub, pinyon-juniper woodland, 5,500-6,500 feet. |
| <i>Penstemon pahutensis</i> Pahute Mesa beardtongue | SOC, BLM | G2S2 | Perennial herb arising from root crown; flowers June-July | On loose soil, rock areas; in barren areas and pinyon-juniper woodland, 5,800-7,500 feet. |

| Table D-1 Special Status Plant Species Known or Likely to Occur on NTTR within the Vicinity of the Proposed Action (page 3 of 3) | | | | |
|---|--------------------------------------|----------------------------------|---|---|
| <i>Scientific Name Common Name</i> | <i>Regulatory Status¹</i> | <i>Heritage Rank²</i> | <i>Description, Flowering, Period</i> | <i>Distribution and Habitat (reference)</i> |
| <i>Perityle megaloccephala</i> var. <i>intricata</i> Delicate Rock Daisy | SOC, BLM | G3S3 | Perennial shrub flowers April-September | Creosote bush shrub, crevices or rubble of carbonate outcrops, 2,600-6,000 feet. |
| <i>Phacelia beatleyae</i> Beatley's phacelia | SOC, BLM | G2S2 | Diminutive annual herb; flowers April-May | On gravel or volcanic tuff, along washes and in canyons, also on slopes. In barren areas, creosote bush scrub, shadscale scrub, 2,500-5,800 feet. |
| <i>Phacelia parishii</i> Parish's phacelia | SOC, BLM | | Low-spreading annual herb; flowers in May | Playas, shadscale scrub, 3,000-3,200 feet. |

Source: Air Force 1999. Renewal of the Nellis Air Force Range Land Withdrawal Legislative Final Environmental Impact Statement. Air Combat Command, Langley AFB, VA. March.

1. Status abbreviated as follows:

Federal Status

FC = Candidate for federal listing as threatened or endangered.

SOC = Federal Species of Concern, indicating former candidate status and potential for reconsideration in the future.

BLM = Listed on Nevada BLM Sensitive Species List (4/97).

State Status

CE = Listed as Critically Endangered by the Nevada Division of Forestry

2. TNC Rankings (TNC 1997) abbreviated as follows:

G = Global rank indicator, based on worldwide distribution at the species level.

T = Trinomial rank indicator, based on worldwide distribution at the infraspecific level.

S = State rank indicator, based on distribution within Nevada at the lowest taxonomic level.

1 = Critically imperiled due to extreme rarity, imminent threats, or biological factors.

2 = Imperiled due to rarity or other demonstrable factors.

3 = Rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction.

4 = Apparently secure, though frequently quite rare in parts of its range, especially at the periphery.

5 = Demonstrably secure, though frequently quite rare in parts of its range, especially at the periphery.

| Table D-2 Special Status Wildlife Species Known or Likely to Occur within the Vicinity of the Proposed Action on NTTR (page 1 of 2) | | | |
|---|----------|-------|---|
| Species | Status | | Occurrence on Range, Overflight Areas |
| | Federal | State | |
| Threatened or Endangered Species | | | |
| Desert tortoise (<i>Gopherus agassizii</i>) | T | T | Present in low densities throughout Mojave Desert scrub habitat. |
| Special Status Species | | | |
| Pygmy rabbit (<i>Brachylagus idahoensis</i>) | SOC | | Found in sagebrush communities where stands are dense, alluvial habitat is preferred. Potentially occurs on NTTR. |
| Spotted bat (<i>Euderma maculatum</i>) | SOC | T | Found in various habitats from desert to mountain coniferous forest but always in association with nearby high cliff faces. Observed on the NTS and potentially occurs on NTTR. |
| Peregrine falcon (<i>Falco peregrinus</i>) | SOC | | Expected as a rare transient. No records of breeding on NTTR. |
| Western small-footed myotis (<i>Myotis ciliolabrum</i>) | SOC, BLM | | Occurs in a variety of habitats but most common in arid environments. Roosts primarily in caves, buildings, mines, or crevices. Observed on the NTS and potentially occurs on NTTR. |
| Long-eared myotis (<i>Myotis evotis</i>) | SOC, BLM | | Occurs primarily in forests by also less frequently in sage and chaparral habitats. Roosts in cracks in cliffs, hollow trees, caves, mines and buildings. Observed on the NTS and potentially occurs on NTTR. |
| Fringed myotis (<i>Myotis thysanodes</i>) | SOC, BLM | | Found in desert scrub, shrub-steppe, oak-pinyon and coniferous forest habitats. Roosts in caves, rock crevices and buildings. Observed on NTTR. |
| Long-legged myotis (<i>Myotis volans</i>) | SOC, BLM | | Typically associated with montane forests but also found in riparian and desert habitats. Roosts in rock crevices in cliffs, cracks in ground, behind loose bark on trees, and buildings. Observed on NTTR. |
| Townsend’s big-eared bat (<i>Corynorhinus townsendii pallescens</i>) | SOC, BLM | | Roosts in caves, mines and buildings. |
| Least bittern (<i>Ixobrychus exilis hesperis</i>) | SOC | | Observed in wetlands of Pahrnagat Valley. Expected in small ponds on NTTR infrequently in small numbers. |
| White-faced ibis (<i>Plegadis chihi</i>) | SOC | | Observed in wetlands of Pahrnagat Valley. Expected in small ponds on NTTR infrequently in small numbers. |
| Ferruginous hawk (<i>Buteo regalis</i>) | SOC | | Spring and fall migrant and winter visitor in low numbers. No records of breeding on NTTR. |

| Table D-2 Special Status Wildlife Species Known or Likely to Occur Within the Vicinity of the Proposed Action on NTTR (page 2 of 2) | | | |
|--|----------------|--------------|---|
| <i>Species</i> | <i>Status</i> | | <i>Occurrence on Range, Overflight Areas</i> |
| | <i>Federal</i> | <i>State</i> | |
| Black tern (<i>Chidonias niger</i>) | SOC, BLM | | Observed at wetlands in Pahrangat Valley. Spring and fall migrant and summer visitor to the region and possibly the NTTR. |
| Burrowing owl (<i>Athene cunicularia</i>) | SOC | P | A spring and fall migrant and breeder on the NTTR. Recorded on NTTR in Great Basin desert scrub and expected in slightly disturbed areas. |
| Phainopepla (<i>Phainopepla nitens</i>) | BLM | P | A permanent resident of Mojave Desert scrub and desert spring habitats. Observed on NTTR. |
| Chuckwalla (<i>Sauromalus obesus</i>) | SOC, BLM | | Expected in rocky hillsides and rock outcrops within the Mojave Desert scrub community. |

Notes: E Endangered

T Threatened

SOC Federal Species of Concern

BLM Nevada BLM Sensitive Species List

CE Listed as Critically Endangered by Nevada Department of Wildlife

P Protected by the Nevada Division of Wildlife

Source: Air Force 1999. Renewal of the Nellis Air Force Range Land Withdrawal Legislative Final Environmental Impact Statement. Air Combat Command, Langley AFB, VA. March.

